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ABSTRACT

The technical report has provided a functional description of an operational program planning and evaluation component called Operation Guidance, which is part of the Career Planning Support System (CPSS). (The CPSS, a systematic approach to improving high school career planning programs, has addressed itself to the critical career guidance deficiencies of career development of minority youth, career development of women, program planning and evaluation, and the transition from school to work.) Operation Guidance will provide a package of manuals, procedural guides, audiovisual aids, and inservice materials that are designed to serve as a tool with which individual high schools can design, implement, and evaluate their own career planning programs. Following an introductory section, Section 2 traces product development, Section 3 describes methodology, Section 4 discusses design decision, and Section 5 describes the national field test. Field testing is scheduled from September 1974 to June 1976, with the entire CPSS materials scheduled for availability in late 1976. Approximately half of the document consists of supplementary appendixes, including Operation Guidance product elements, product and installation specifications, plan for behavioral objectives, product engineering phase position description, and national field test position description (school coordinator for Operation Guidance). (EA)

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THE PRODUCT ENGINEERING OF A SYSTEM FOR UPGRADING HIGH SCHOOL CAREER PLANNING PROGRAMS

Technical Report: A Case Study in Educational Technology

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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CE 004 732

Career Planning Support System

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THE CENTER MISSION STATEMENT

The Center for Vocational Education's mission is to increase the ability of diverse agencies, institutions, and organizations to solve educational problems relating to individual career planning and preparation. The Center fulfills its mission by:

- Generating knowledge through research
- Developing educational programs and products
- Evaluating individual program needs and outcomes
- Installing educational programs and products
- Operating information systems and services
- Conducting leadership development and training programs

PREFACE

The challenge to assist youth in gaining the skills and knowledge to plan and execute meaningful careers is a primary concern of the educational community, particularly high schools. To help meet the challenge, The Center has been developing and testing a systems approach for high schools to use in delivering career development services to youth. The Career Planning Support System has two major parts: operational planning and evaluation procedures, and innovative career guidance strategies for special populations. The development of the planning and evaluation procedures (referred to as "Operation Guidance") is the focus of this report.

The primary intent of this technical version of the report is to provide other developers of educational products with a case study which describes in detail the building of a comprehensive system for solving a pervasive and chronic problem in American education. A general version of the report, which is available from The Center, is intended to provide information about the Career Planning Support System to career education practitioners at all levels.

We appreciate the contributions of the participants in the six schools that helped make this part of the Career Planning Support System a realistically developed and viable product. The many people to whom special appreciation is due are listed elsewhere in the report, but I would like to acknowledge here the contribution of the work unit staff headed by Warren N. Suzuki, and assisted by Richard P. Coatney, Harry N. Drier, and Paul E. Shaltry; and to Robert E. Campbell, program director, Career Planning Support System.

Robert E. Taylor
Director

TABLE OF CONTENTS

PREFACE iii

I. INTRODUCTION 1

The Problem 1
Career Planning Support System 2
Procedural Model 2
Approach to Product Engineering 2
Overview of Remainder of Report 5

II. PRODUCT DEVELOPMENT 7

Framework 7
Population 7
Specifications 9
An Innovation Package 10
Process of Operation Guidance 11
Identifying Needs and Resources 11
Goals 11
Behavioral Objectives 13
Methods 13
Career Development Units 13
Evaluation 13
Roles for School Personnel 14
The School's Cost 15
Personnel 15
Supplies 15
Staff Development 16
Organization 16
Steering Committee 16
Task Forces 16
Data Collection and Tabulation Task Force 17
School and Community Description Task Force 17
Behavioral Objectives Task Force 17
Method Analysis Specialists 17
Career Development Unit Coordinators and Advisors 18
Career Development Unit Advisors 18
Advisory Committee 19

III. METHODOLOGY 21

A. General Process 21
B. Initial Prototype Production 23
C. Collection of Evaluative Data 27
Site Identification and Preparation 28
Site Survey 29
Site Preparation 29
Procedures 29
Field Associates 30
Instrumentation 30
D. Revision 32

IV. DESIGN DECISIONS 35

Specifications 35
Organization 36
Needs Assessment 37
Data Collection 39
Goals 40
Resources 40
Behavioral Objectives 40
Career Development Units 41
Installation Concerns 41

V. A NATIONAL FIELD TEST 43

Design and Schedule 43
Field Test Purpose 43

REFERENCES 45

APPENDIX A – STAFF AND ACKNOWLEDGEMENTS 47

APPENDIX B – OPERATION GUIDANCE PRODUCT ELEMENTS 51

APPENDIX C – PRODUCT SPECIFICATIONS, INSTALLATION SPECIFICATIONS, AND CONDITIONS FOR PRODUCT IMPLEMENTATION 55

APPENDIX D – AIDE PLAN FOR BEHAVIORAL OBJECTIVES 63

APPENDIX E – PRODUCT ENGINEERING PHASE POSITION DESCRIPTION . . . 85

APPENDIX F – NATIONAL FIELD TEST POSITION DESCRIPTION: SCHOOL COORDINATOR FOR OPERATION GUIDANCE 87

FIGURES

1. Major Stages in Developing the Program Planning and Evaluation Component of CPSS (Not to Scale) 3

2. Procedural Model for Developing Career Guidance Programs 4

3. General Construct for the Program Planning and Evaluation Component 8

4. Operation Guidance Process Flow (Major Activities and Sequence Only) 12

5. General Product Engineering Phases and Concurrent Activities 22

6. General Procedure for Production of the Product (Only Major Path Shown) and Its Relationship to Field Trials 24

7. Levels at Which the Operational Program Planning Component of CPSS, an Externally Developed Product, Could be Assessed and Associated Risks and Costs for Ambition (Not to Scale) 26

8. Non-Technical Career Development Skills 38

009

I. INTRODUCTION

The Problem

The process of developing a satisfying career is a complex undertaking that young people, in particular, tend to stumble through at great expense to themselves and society. Many youth are inadequately prepared for life roles they will assume in the community (National Advisory Council for Vocational Education, 1972; Ginzberg, 1971, as examples). Thus, despite its advances, the American educational system today is being harshly criticized for shortcomings in preparing adaptably useful and employable citizens. The problem has long-range implications. Because of the changing nature of our society and the job market, young people not only need to make career decisions for their first years after leaving high school but also must be well enough prepared to plan for career changes throughout their lives. They need to know how to cope with change--to know the importance of continued learning and how to continue to learn and to be able to make and implement a series of career decisions compatible with their own potentials and desires.

Traditionally, the major responsibility of helping students with career planning has been delegated to schools. Furthermore, the primary focus for delivering career planning assistance to students, traditionally, has been through guidance programs, more specifically, counselors. However, limited national assessments of career guidance programs, such as those conducted by Herr (1968), Ehrle (1969), Gelatt (1969), Rosen (1969), and Ginzberg (1971), have indicated that career guidance programs have been neither effective nor efficient.

Career guidance includes in its functional domain a wide assortment of services, ranging from personal counseling through information providing, to attendance keeping. Educational personnel, usually guidance counselors, have been developing career guidance programs based on prescriptions found in their professional literature, dicta emitted by district and state educational agencies, and pressures of other educational personnel in their schools. Fads and political expediencies have also dictated program content and configuration.

Based on a national study, Campbell et al. (1968) concluded that the root problem with career guidance programs appears to be that high schools attempt to offer more career guidance services than they can effectively support with available and realistically obtainable resources. The study also indicated that only a few school programs have implemented recent innovations in career guidance methods and techniques. If student needs for career planning assistance are to be satisfied, then high schools should have career planning programs that have been developed both systematically and realistically.

At this time, it is highly doubtful that a single, standardized program could be developed to meet the requirements of widely varied local conditions and student populations. However, each high school and/or school system should be able to develop a career planning program that effectively and efficiently responds to local conditions and unique student populations by applying systems technology.

National attention has been focused on the role of career guidance. Although career guidance is only a part of a troubled educational system, educators recognize its potential for becoming an effective means of helping all students in an important way. There appears to be a definite climate for positive change.

Career Planning Support System

The Center for Vocational Education (CVE) at The Ohio State University has undertaken the development of a systematic approach to improving high school career planning programs. This program, called the Career Planning Support System (CPSS), is sponsored by the National Institute of Education (NIE).

The construction of the Career Planning Support System requires the progressive contribution of four parallel strands of research and development. Each strand addresses a critical career guidance deficiency. The four strands are: (1) the career development of minority youth, (2) the career development of women, (3) program planning and evaluation, and (4) the transition from school to work.

Procedural Model

This report deals with but one aspect of the CPSS, the product engineering of an operational program planning and evaluation component. The antecedents of this effort are based on a national survey and report of the status of career guidance (Campbell, 1968) and a feasibility study that included the development of a procedural model (Campbell, 1971). The major stages of the developmental effort are depicted in Figure 1.

It is from the procedural model (feasibility study) that the product engineering phase took its direction in building an operational product for high schools. The procedural model is graphically presented in Figure 2 and was initially designed for use at all levels of public education.

Parts of the procedural model were subjected to a simulated trial at a comprehensive, urban high school. The procedural model, per se, however, was not readily usable by school personnel at the high school level of public education since application of the model required specialized knowledge of and skills in a variety of fields, such as career development theory, measurement, evaluation, and survey research, to name a few.

Approach to Product Engineering

The product engineering phase was conducted from February 1, 1971 to September 30, 1974. During this time the developers sought to build a relatively inexpensive package that could be used in comprehensive high schools across the country. Further, it was intended that the resulting package of materials could be used without the help of the developers or others acting as consultants primarily due to the potential drain that external assistance can make on already hardpressed resources of high schools and sponsors of research and development.

Figure 1. Major Stages in Developing the Program Planning and Evaluation Component of CPSS
(Not to Scale)

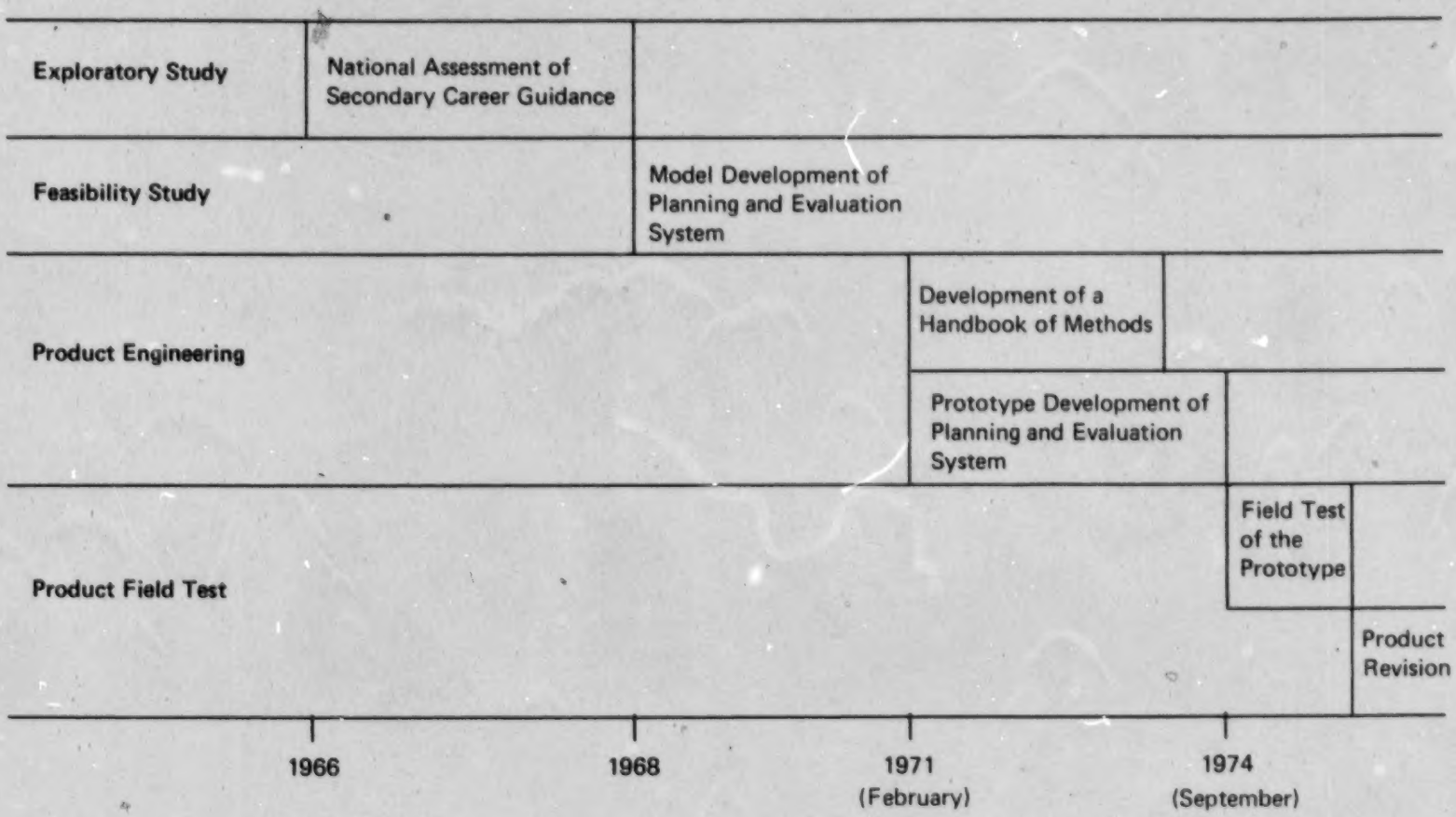

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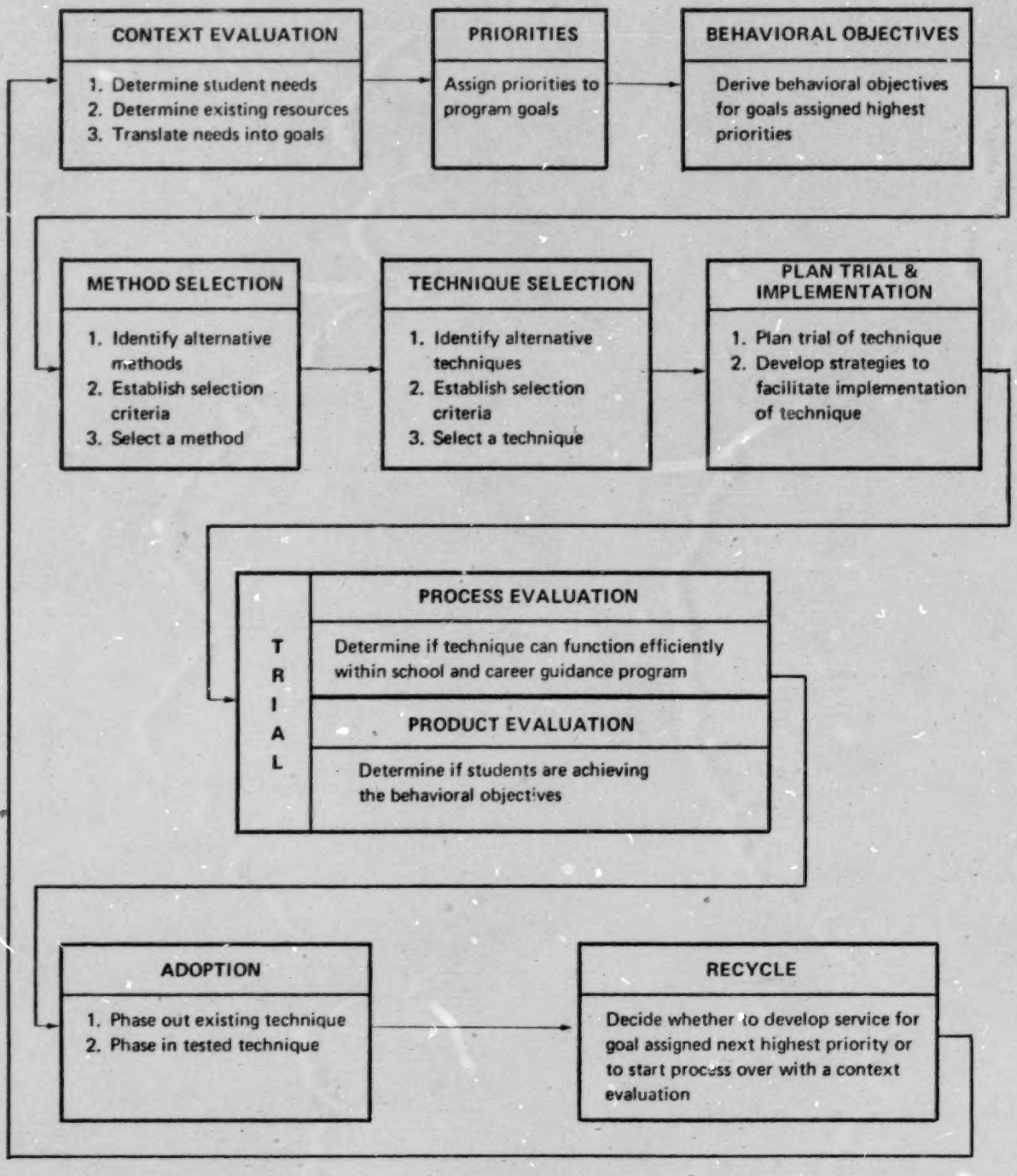
Figure 2. Procedural Model for Developing Career Guidance Programs*


CONTEXT EVALUATION
1. Determine student needs
2. Determine existing resources
3. Translate needs into goals
PRIORITIES
Assign priorities to program goals
BEHAVIORAL OBJECTIVES
Derive behavioral objectives for goals assigned highest priorities
METHOD SELECTION
1. Identify alternative methods
2. Establish selection criteria
3. Select a method
TECHNIQUE SELECTION
1. Identify alternative techniques
2. Establish selection criteria
3. Select a technique
PLAN TRIAL & IMPLEMENTATION
1. Plan trial of technique
2. Develop strategies to facilitate implementation of technique
TRIAL
PROCESS EVALUATION
Determine if technique can function efficiently within school and career guidance program
PRODUCT EVALUATION
Determine if students are achieving the behavioral objectives
ADOPTION
1. Phase out existing technique
2. Phase in tested technique
RECYCLE
Decide whether to develop service for goal assigned next highest priority or to start process over with a context evaluation

*Campbell, Suzuki, Gabria, Jr., 1972.

Overview of Remainder of Report

The balance of this report deals with a functional description of the planning and evaluation component of the CPSS as it existed on the threshold of the two-year field test that began in September 1974. Following the product description is an account of the methodology employed during the product engineering phase. This serves to acquaint the reader with the tools and techniques that were used to develop the product. The "Rationale for Design Decisions" section addresses the major changes made in the product as a result of trying elements in realistic settings. The last section provides a forecast for the product as it relates to the development of the CPSS, the implications of the field test, and eventual availability.

II. PRODUCT DESCRIPTION

The product engineering phase of the Operation Guidance component of the CPSS generated a full complement of interrelated materials designed primarily for use in comprehensive high schools in the United States but, with modification, could be used in all the nation's high schools. What follows is a brief description of the product, an overview of its process, and a description of how it works in the school setting.

Framework

The general framework upon which the program planning and evaluation component of the CPSS was developed is depicted in Figure 3. The ultimate purpose of the CPSS is to reduce the amount of career floundering now experienced by many people in the world of work (the ultimate target population). To ameliorate this problem, students (the intermediate target population) in high school need to attain career development competencies through, among alternative ways, a career planning program which is a compilation of resources (people, materials, equipment, and space) in the school and the surrounding community. The planning, organizing, directing, and controlling, or management of these resources could facilitate the effective and efficient delivery of services to students. It should be noted, however, that the delivery model exists within an environment and that the environments across schools, although possibly having common elements, are in many ways unique. Although the commonalities should be addressed, the differences must, to the degree feasible, be accommodated.

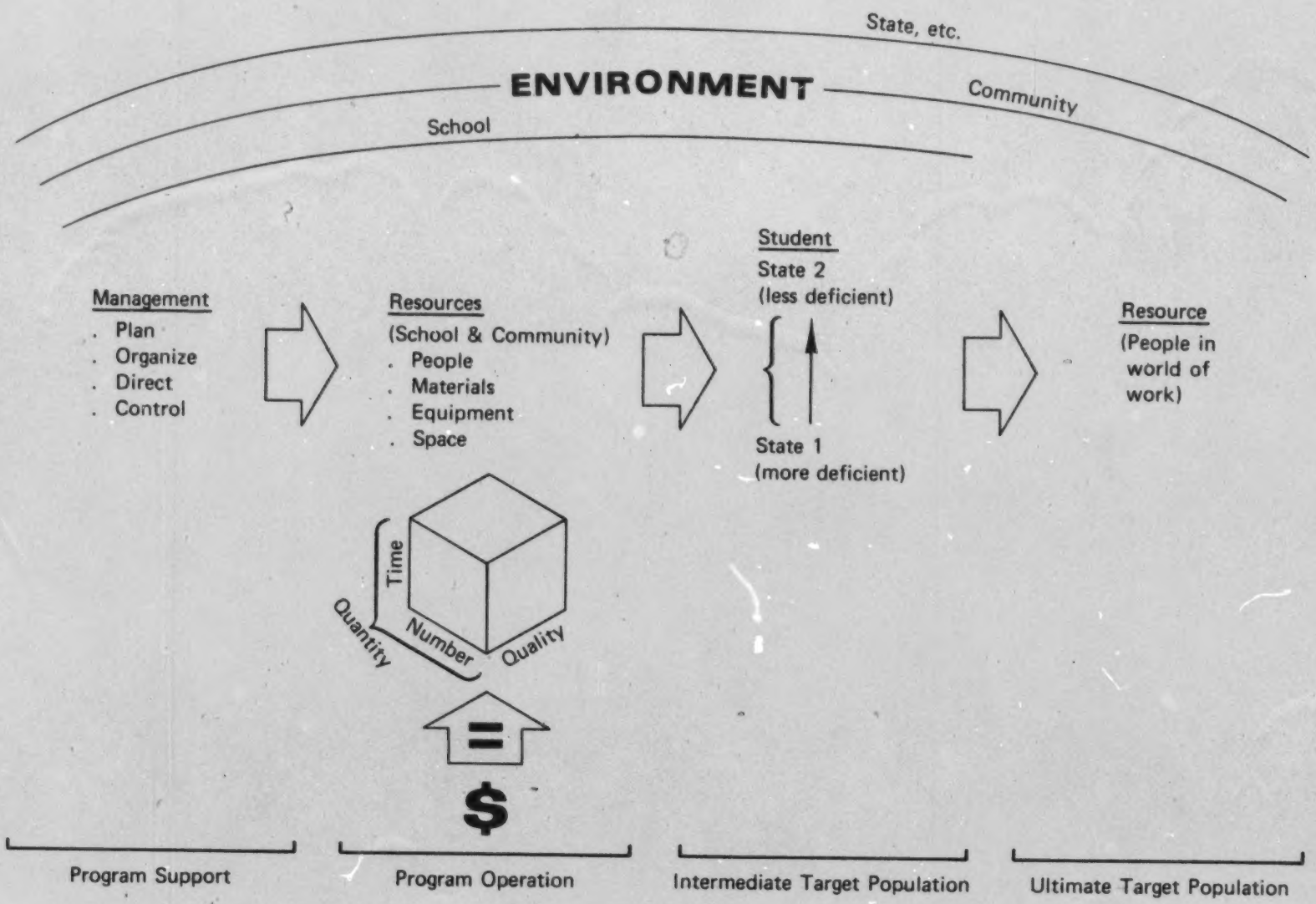
Resources for program operation coupled with program support for career planning are qualitatively and quantitatively finite and determine the upper limits of the services that can be provided to students. The expectations of a career planning program are limited by the resources available, i.e., the quantity (number and time combined) of people, materials, equipment, and space of a certain quality for providing assistance to students. The resource base for a program can only be expanded through the reallocation of resources in the school at large or the greater community. Regardless, resources are equateable to dollars, and any reallocation of resources is ultimately a reallocation of funds within the school and the community.

The availability of resources, although necessary, will not in itself result in a "better" program. Therefore, the optimal organization of existing resources (whether currently used or not) seems to be critical to the maximization of the capacity of a career planning program to enable students to attain the necessary, if not all of the desirable, career development competencies to function effectively in his/her future life.

Population

The Operation Guidance component of the CPSS has been designed for use by high schools. In order to acquire maximum benefit from the component, a school should have certain characteristics. In general, a using school should be stable and receptive and have the climate for change. A description

Figure 3. General Construct for the Program Planning and Evaluation Component



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of some of the indicators of a desirable environment is given in Appendix D (pages 63-83). These characteristics, however, have not been fully verified. Also, it is doubtful that many schools, if any, possess all of the desired characteristics. Therefore, the degree to which the product is compatible to a school is determined by the extent to which the school is able to adopt it. That is, a school will benefit from the product if it is ready and able to change.

Specifications

A variety of outcomes, both short- and long-range, may result from the successful application of Operation Guidance. Of course, the degree to which results become evident is dependent on the degree to which students, teachers, administrators, counselors, and community members become actively involved in and committed to effecting change through systematic planning and evaluation, in general, and the product, in particular. These results are summarized as follows:

1. A display of valid data indicative of student career development needs;

2. A comprehensive record of resources that are available in both the school and community to support career planning activities;

3. A list of career development goals and the priority that each should have for implementation;

4. A sufficient number of valid, behaviorally stated objectives indicative of goals;

5. Instructional strategies and methods, called, "career development units," designed to enable student(s) to achieve a goal or a set of goals;

6. A capability on the part of the school to plan, implement, review, evaluate, and, if necessary, revise career planning activities (resources) over an indefinite period of time.

The above results could occur within one school year. There are, however, long-range results that may not become apparent immediately. For instance, after two years of implementation, the product could enable a school to show whether any career development needs have changed. In time, by effectively using resources, the ultimate outcome—amelioration of student needs—should become apparent.

The specifications for Operation Guidance, that is, the desired outcomes of and outputs from those in the instrumental population who use it, are listed in Appendix C. For developmental purposes, the specifications are classified into two types: product and installation. Product specifications describe those outputs (e.g., documents) that the instrumental population in a participating school should produce if they want to make systematic changes. Installation specifications are concerned with those outcomes (changes in behavior) and outputs of the instrumental population that should enable their achievement of the product specifications. Although product specifications are related and integrated in the materials, the categorization was made to emphasize the importance of product adoption to the eventual success of a school's application of the program planning and evaluation component. The importance of the bifurcation of the specification is discussed further on pages 23-26.

An Innovation Package

As an educational innovation, the product sets the climate for improving career planning programs by providing a systematic yet practical set of procedures for improvement. The Operation Guidance process encourages administrators, teachers, parents, students, and community members to participate in defining local career development needs, restructuring priorities, and developing ways to help students attain career development skills. The extent of help any high school can give is limited only by the resources available or potentially available to support student-oriented career planning activities.

Systems methodology is utilized in the product. The systems approach is a logical, efficient way to solve problems. Although used successfully in government and industry, the systems approach is relatively new to public education. The method should enable a school to organize career development information and strategies into a manageable structure based upon current career development needs of students (Campbell, 1971).

The product does not necessarily prescribe program content; however, it serves as a tool for designing, implementing, and evaluating a school's own career planning program. The package includes:

1. Guides detailing procedures for collecting data from students, faculties, graduates, and parents and from the community and school and their resources, deriving program goals, formulating behavioral objectives, creating Career Development Units, and evaluating the career planning program.

2. Survey questionnaires.

3. Manuals that provide instruction for performing technical tasks.

4. Supporting references (e.g., a handbook of career guidance methods).

5. Forms for recording information, decisions, findings, etc.

6. Synchronized audiovisual presentations for providing introductory information to the total package and its major tasks.

7. A comprehensive preservice and in-service staff development program using simulation techniques.

A more detailed list of product elements is given in Appendix C.

The materials are written so a school may use them as fast as it deems possible and necessary. Tangible student activities, however, usually occur during the first school year of using the product, which was designed to be compatible with existing career development programs. Rather than ignoring current efforts, the product provides a framework for using or modifying existing programs, if needed, and coordinating both new and existing efforts.

Lasting and meaningful change rarely comes easily and quickly, and change resulting from the use of the product is no exception. Operation Guidance is a continuous, long-term process of

systematic improvement. The product is designed to enable a career planning program to keep pace with changes in the school, students, and the local and national community. Figure 4 is a graphic description of the general sequence of the major activities of the planning and evaluation component of the CPSS.

Process of Operation Guidance

The product has detailed procedures for organizing faculty, students, and members of the community to accomplish programmatic development. The general tasks are: (1) identifying and documenting needs and resources, (2) stating, ordering, and selecting program goals, (3) deriving behavioral objectives, (4) developing and implementing career planning activities (career development units), and (5) evaluating the effectiveness and efficiency of the units and program.

Identifying Needs and Resources

Survey questionnaires are administered to students to determine their career development needs. More general questionnaires are also completed by parents, faculty, and recent graduates of the school, asking their opinions of the type of career development areas that the high school should emphasize. This information should enable the school to identify the strengths and weaknesses of its career planning program.

While surveys are being administered and tabulated, a task force collects information about the school and community that most likely will be of value to developing the career development program. This information includes a list of resources (people, space, materials, and equipment) and funds to purchase resources, that could be used for career planning activities designed to ameliorate the needs of the students.

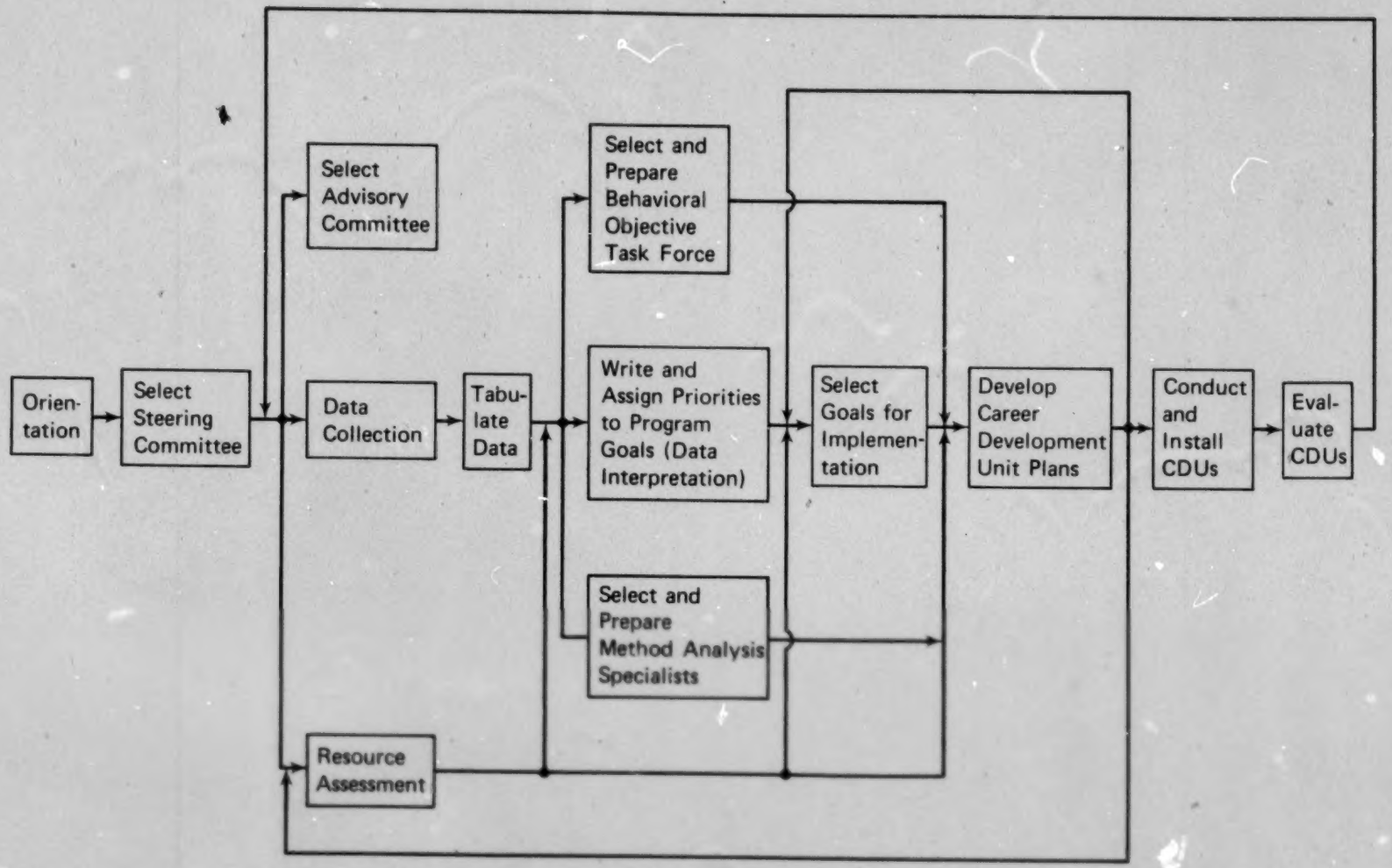
Goals

Identified student needs are translated into goal statements. These program goals state the skills, information, and attitudes students should have in order to choose and plan a career. Goals are derived from information collected in the surveys, state and local educational requirements, career development activities already being used in feeder schools, and the school itself.

Career planning activities are designed to help students achieve these goals. Sufficient resources will most likely not be immediately available to support all learning activities for all of the goals, therefore, the goals are ranked in order of importance based on available information, such as apparent magnitude of student deficiencies, mandates, parental preferences, etc. Some of the goals are then selected for implementation. Usually resources are allocated to the most important goals first, then to other goals as resources become available. Regardless, a goal assigned a higher priority should be fully supported before resources are allocated to one assigned a lower priority.

A community based advisory committee reviews the goals, the priorities assigned to them, and the goals selected for implementation. Recommendations may also be made to improve the goals. Finally, the principal reviews and, if appropriate, confirms or reassigns priorities to the goals that should be implemented.

Figure 4. Operation Guidance Process Flow
(Major Activities and Sequence Only)



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Behavioral Objectives

Once goals are selected for implementation, planning begins for the learning activities designed to achieve the goals. A coordinator is chosen to oversee the development and implementation of activities for each goal that has been selected. With the assistance of at least two persons skilled in writing behavioral objectives, each coordinator writes the major behavioral objectives, called criterion objectives, for each goal to be implemented. These objectives state what skills, knowledge, and attitudes students (who participate in the career planning activities designed for the goal) are expected to exhibit after participating. The team composed of the coordinator and two behavioral objective specialists also derives enabling objectives which specify the skills, knowledge, and attitudes that students should have in order to attain criterion objectives. Also, it may be necessary to develop enabling objectives, for each goal to be implemented. These objectives state what skills, knowledge, and attitudes the students (who participate in the career planning activities designed for the goal) are expected to exhave implication for staff in-service activities and a public information program, to name a few.

The number, scope, and complexity of criterion and enabling objectives should give some indication of the ways in which students could be introduced to the career planning activities. The objectives may be appropriate for immediate introduction in a regular class. On the other hand, they may be comprehensive enough to indicate that a separate course is needed to achieve a goal or a set of goals. Exploring alternatives is encouraged, both within and outside the existing curriculum. Proposed objectives undergo a review process prior to their final approval to assure their validity and desirability.

Methods

The next stage of Operation Guidance transforms plans into action. Although behavioral objectives define what students are to achieve, schools have to choose ways for the objectives to be achieved. Most likely there will be more than one way to achieve each objective. The task is to select instructional and/or counseling methods that are appropriate to the individual or groups of students participating in the career planning activities. In audition, the methods chosen should use a school's resources efficiently.

Career Development Units

All goal-related information is collected into a formal plan for a career development unit(s). A career development unit (CDU) is a planned learning activity that attempts to enable students to achieve one or a logical set of career developme goals that have been written for the program. The plan developed for a career development unit identifies the behavioral objectives that have been derived for each goal, the instructional methods and resources that will be used for attaining each objective, and the manner in which the CDU will be installed into the school. This career development unit plan is subject to the principal's final approval with interim review by the Steering and Advisory Committees.

Evaluation

Three levels of evaluation occur.

1. At the completion of and, if desirable, during each career development unit, the participating students critique the usefulness of the activity for attaining each behavioral objective and whether the activity was interesting. The person in charge of the career development unit assesses the extent to which each behavioral objective of the unit was achieved by the students involved. In addition, a leader summarizes the students' evaluation and describes the advantages and disadvantages of the activities designed to achieve each objective.

The information obtained from this evaluation can be very helpful in indicating revisions that might be made to increase the effectiveness of the career development unit. Adjustment should be made to reflect these changes.

2. An annual review is conducted of all career development units that have taken place during the year. The result of this review might mean a greater number of students would be involved during the next execution of the career development unit, changes could be made in the way resources are allocated, etc.

The Operation Guidance process continues to improve a school's program by increments, developing career development units as long as unmet needs exist and resources are available. Evaluation facilitates the determination of the continued validity of the program as it is used and grows.

3. The third level of evaluation is called "recycling." The recycling process was designed to increase the probability that the career planning program continues to be effective in meeting students' needs, since the career development needs of students may change over time. Therefore, every two years the surveys are again administered to first- and last-year students of the school, their parents, the school/staff, and recent graduates.

Information reflecting the needs of first-year students and those in the twelfth grade are recorded on graphs each time the surveys are administered (every two years). These graphs should indicate whether students' need for a given skill increases, decreases, or remains stable. Several adjustments in the career development program could result from this information. The priorities assigned to goals could be changed; the behavioral objectives for a given goal could be revised; and/or a career development unit could be expanded, decreased, or eliminated.

Roles for School Personnel

The success of a developmental project in a given school is dependent on the cooperation of individuals. To facilitate this cooperation, the materials suggest positions and roles to be assumed by people in the school and in the community. The positions suggested are flexible as to how a school wants to fill them. The foundations of the planning and procedural component of the CPSS encourages differentiated staffing in career planning activities in the school. Certainly, counselors play a key role, but the overall effort can be enriched by judiciously combining the skills and talents of many people. The following is a brief description of the project positions.

The two leadership roles called for by the program rest with the principal and the project coordinator. The principal is the key person in establishing the commitment that a school and community makes toward the successful conduct of the project. As the chief executive officer, the principal is ultimately responsible for all that happens in the school, including the success or failure of the project.

In addition to the leadership shown through overt commitment to the project, however, the degree to which a principal directly manages the project or delegates responsibility and authority is his/her own decision.

In addition to the principal, the project coordinator needs to have a firm grasp of the scope and intent of Operation Guidance. It is recommended that the project coordinator be given at least half-time for the day-to-day management of the project. The coordinator serves as the link between the principal and project activities. It is recommended that he/she also serves as the Steering Committee chairperson. As a change agent, the coordinator should be able to work well with all groups in order to be effective. The position description for a coordinator is given in Appendix G.

The School's Cost

Personnel. Many people should be encouraged to participate in the project. One advantage of large-scale participation is to keep each individual's time expenditure at a reasonable level. In addition, involving a cross-section of individuals could result in greater faculty and student commitment to the project and the resulting upgraded career planning program.

The approximate number of positions and the estimated time commitment that incumbents in any of the many positions would need to spend during each year of a project are as follows:

1. Five to seven Steering Committee members (three to five faculty/staff members and two students) at an average of one and one-half hours per week.

2. Forty task force members (sixteen to twenty faculty/staff members and eighteen to twenty student members) at an average of two hours per week for eight to ten weeks.

3. A number of CDU coordinators equivalent to the number of active CDUs.

An individual may occupy more than one position. Also, total number of people could be scaled downwards as the number of students in the school decreases below 600.

Supplies. The supplies and equipment listed below will be needed during the project's first year. Additional expendable supplies will be needed during subsequent years in which the package is used, but at a considerably lower level.

1. Printing (offset or comparable method) – the number of pages will be approximately 8.5 times the number of students in the school.

2. Duplication – 200 copies, preferably by electrostatic process.

3. Postage (if surveys are mailed) – approximately $100.

4. Office supplies (excluding paper for reproduction) – two reams of letterhead and 1,400 business-size envelopes imprinted with the school's name.

5. Equipment – a 35 mm circular slide projector with remote controls that, optionally, is coupled with a slide-sound synchronizer capability.

Staff Development

Staff development is an integral part of the product. The various subtasks are explained and constructed in a semi-programmed instructional format. This way a task may be executed and, at the same time, the performer can be learning, for example, survey research techniques. Another mode of staff development is used for special skills such as writing technically sound program goals and behavioral objectives. Staff development materials are also provided so a simulation of the project can occur before actually implementing the project in the school.

Organization

Several groups are formed on both a temporary and permanent basis. The following is a description of committees, roles, and functions.

Steering Committee. The Steering Committee is composed of teachers, counselors, and students, and has three functions: (1) manages the project, (2) serves as a major decision-making body, and (3) acts as representatives of the school population.

As a managerial body, the Steering Committee is responsible for coordinating the many activities that are part of the project. Its duties include making certain that resources needed to carry out activities are available. It monitors the work of task forces to be certain that tasks are completed appropriately and in as short a time as possible. It also serves the function of coordinating tasks performed by these different work groups. The committee has the responsibility of storing all data and products of the project in such a manner that information may be located easily as it is needed.

The Steering Committee is a major decision-making body. It has the responsibility of assuring that the upgraded program reflects the career planning needs of all students in the school. The Steering Committee writes goals for the program and decides the order in which goals will be carried out, based on information collected from the school and community. The Steering Committee reviews behavioral objectives and plans for career development activities that are made to achieve these goals to provide assurance that they are complete, accurate, and appropriate. The committee submits recommended goals, behavioral objectives, and plans for career development activities to the principal.

There are usually five to seven members in the Steering Committee in addition to its chairperson, depending on the number of counselors in the school. It was assumed that the number of counselors in a school would be indicative of the potential resources available for career planning activities and the priority currently assigned to the career development of students. Also, the expertise of guidance counselors was needed for a variety of tasks and, therefore, it was necessary to allocate this possibly limited resource. As representatives of the school, Steering Committee members are encouraged to seek out others' advice as they work on the tasks described previously.

Task Forces. Task forces are work groups usually composed of students, teachers, and counselors. These groups are formed on a temporary basis to perform certain duties. Different task forces are formed to collect and tabulate survey data, to collect information about the school and community,

and to assist with the writing of behavioral objectives for program goals. The number of people on a task force depends on the activity to be completed.

Data Collection and Tabulation Task Force. It is suggested that the Steering Committee chairperson act as the needs assessment leader for this task force. Duties include initiating and monitoring the activities of the various task force teams during the collection of survey data, receiving and storing data collected from surveys, assigning data tabulation tasks to team members and monitoring their work during data tabulation, and properly storing the surveys and end products for safe keeping when all work has been completed.

Six or seven faculty/staff members (depending on the number of grade levels in the school) should serve on the task force. Their duties include helping to prepare and collect surveys and overseeing the process of transferring information from surveys to appropriate data summary tables. Fourteen to sixteen students, depending on the number of grade levels in the school, should also serve on the task force. Their duties include helping to prepare and collect surveys and transferring survey information to appropriate data summary tables under the supervision of faculty/staff members.

School and Community Description Task Force. Duties of the chairperson for this task force include initiating and monitoring the tasks involved in the collection of background information and available resources in the school and community and keeping an up-to-date record of the resources available for career development activities and how they are used. It is strongly suggested that the chairperson be drawn from the Steering Committee to facilitate the coordination of the project's activities. In addition to the chairperson, two faculty/staff members and four student members should serve on the task force. Their duties include collecting information about the characteristics of the school and community and listing resources available to upgrade the school's career planning program. This information is recorded and stored in a loose-leaf binder entitled, "Career Development Data." Unlike the chairperson of the task force whose responsibilities exist throughout the project, members of the task force only serve during the initial compilation of information and as needed during recycling of the school's career development program.

Bahavioral Objectives Task Force. The chairperson of this task force should also be a member of the Steering Committee. It is suggested that the chairperson be skilled in the writing of behavioral objectives. His/her duties include initiating and monitoring the training and activities of the members of this task force and assisting with the writing of behavioral objectives for learning activities that are to be developed and implemented.

Five faculty/staff members should also become behavioral objective specialists. It is suggested that these individuals, if possible, be knowledgeable in the writing of behavioral objectives prior to selection for the task force. Their duties include becoming familiar with the format of behavioral objectives recommended by the materials and then assisting with the writing of behavioral objectives for career development learning activities that are to be developed and implemented.

Method Analysis Specialists. Two individuals are selected to serve as method analysis specialists. It is suggested that one of the two specialists be a member of the Steering Committee. These individuals become familiar with current career guidance methods by studying available references. Their main responsibility then involves meeting with faculty members serving as career development unit coordinators and advisors to assist them with selecting appropriate and effective methods for use in

achieving each of the behavioral objectives written for their career development units. Although they may be inactive most of the time, these specialists will be called upon to assist with method selection for each career development unit that is developed over time. They may also be asked to assist in revising methods used in career development units.

Career Development Unit Coordinators and Advisors. Learning activities (career development units) are designed to help students acquire the skills, knowledge, or attitudes necessary to achieve each goal written for the career development program. The people responsible for developing these activities are called career development unit coordinators and advisors.

The principal and Steering Committee should select an individual with expertise in the subject matter related to the goal or goals to be implemented to serve as a CDU coordinator. Primary responsibility for planning these learning activities for the goal rests with this individual. The duties of this individual include:

- Becoming familiar with the school and community characteristics identified in the Career Development Data binder.
- Writing the primary behavioral objectives, called criterion behavioral objectives, for the goal with the assistance of behavioral objective specialists.
- Together with CDU advisors (if any), deriving the remaining behavioral objectives (enabling objectives) needed to achieve the goal with the assistance of behavioral objective specialists.
- Working with the resource assessment leader, method analysis specialists, and CDU advisors to identify appropriate methods and resources needed to implement a career development unit.
- Conducting evaluations of a career development unit.
- Possibly serving as a career development unit advisor and implementing a career development unit.

Career Development Unit Advisors. If the career development unit should be implemented in several areas or classes so that as many students as necessary will have an opportunity to participate in the career planning activities or in an area in which the coordinator does not have responsibility, advisors should be nominated to assist with the implementation of the career development unit. These individuals would work directly with the students, providing learning activities that will enable them to achieve the behavioral objectives and goals defined in the career development unit. Their specific duties involve:

- Working with the career development unit coordinator and Behavioral Objective Task Force members to derive enabling behavioral objectives for the assigned goal.
- Together with the resource assessment leader and method analysis specialists, identifying appropriate methods and resources needed to implement the career development unit.

- Organizing resources (equipment, personnel, materials, and space) needed for the activities involved in the career development unit.

- Implementing the career development unit.

- Evaluating student achievement of the behavioral objectives of the career development unit.

Advisory Committee

The Advisory Committee is composed of five to nine representatives of the community. This group acts as a liaison between the school and the community and provides recommendations concerning the planning and evaluation of the career development program. The Advisory Committee also serves as a source of information about the students' community environment.

The principal should act as the chairperson of this committee. His duties would include presiding over meetings of the Advisory Committee.

It is strongly recommended that the Steering Committee chairperson serve as executive secretary of the Advisory Committee. His/her duties would include notifying members of meeting dates, keeping records of the proceedings of Advisory Committee meetings, and corresponding with the members of the groups as needed.

The membership of the Advisory Committee should consist of five to nine representatives of the business and educational community, governmental and civic groups, and parents. Their responsibility includes providing information to the Steering Committee and reviewing outputs of the program, such as goals and behavioral objectives, and making recommendations for their improvements.

A school may already have several advisory committees working in different areas. It may facilitate the coordination of and communication among activities if members of some of those committees are on the Advisory Committee for the project. Therefore, it may be beneficial for a school to consider individuals serving on other advisory committees when identifying and selecting members for the Advisory Committee.

If at all possible, the Advisory Committee should have at least one each of the following types of individuals as members:

A. Executive officer of a business-industrial concern or organization.

B. Executive officer of a labor organization or union.

C. Executive officer of the school's parent or parent-teacher association.

D. Director of guidance and/or career education (or his/her representative) for the school district or county.

E. Representative of one of the major community action groups.

Other types of individuals that may be appropriate for membership on the Advisory Committee are as follows:

1. Faculty member of a university or college, preferably a specialist in career guidance and/or education.

2. Representative of the state department of education's agency concerned with career guidance and/or career education.

3. Director of vocational education for the school district or the state department of education.

4. Representative of state department of labor or manpower or the state employment service.

5. Representative of a local office of the U.S. Department of Labor or Health, Education, and Welfare.

6. Representative of a junior high school or middle school from which students transfer to the high school.

This has been an overview of Operation Guidance, the operational planning and procedural part of the CPSS, and, implicitly, its process. It is the version derived from many revisions based on experience in the six high schools widely distributed across the country that participated in the product engineering of the product. The procedural model remained fairly well intact although some steps or modules were combined for efficiency in production and application. The procedures to operate the product in a school were built to accommodate realistic conditions and constraints. Without the help of the six product engineering schools, the product could not have been developed. Once the product was complete, the developers embarked on a two-year national field test of the product which is described in the last section of this report.

III. METHODOLOGY

A. General Process

The product engineering of CPSS (Operation Guidance) was a relatively large scale and complex effort. Initial planning called for the use of multiple developmental stages and phases in addition to the integration and utilization of outputs from other activities within and outside of The Center for Vocational Education.

Figure 5 depicts the general process which was used to develop the operational planning and evaluation component. It also shows two other units that provided major inputs to the component.

During product engineering, the procedural model was implemented through the development of detailed procedures and supporting materials which are usable by comprehensive high schools. During initial prototype development, seven modules* containing procedural guides, instructional manuals instrumentation, etc., following guidelines in the procedural model were developed. The product elements or materials that comprised each module were then subjected to a series of trial and revision cycles. These phases were: (1) conducting a field trial of a module at a comprehensive high school; (2) revising the module based on evaluative data collected during the trial; (3) conducting a second field trial of the module at another high school; and (4) again revising the module. The series of progressive, overlapping phases comprised the formative product engineering stage (Findlay, 1973) of the unit.

The product was then subjected to summative product engineering. Essentially, this was a trial of all product elements as an entire system at four comprehensive high schools. Evaluative data concerning the functioning of the entire system were collected. Based on this information, the system was again revised, resulting in the product described in Chapter II of this report.

Conceptually, formative product engineering was concerned with the internal validity and usableness of individual elements and modules of the planning and evaluation component. Summative product engineering, on the other hand, primarily focused on the internal validity of the entire planning and evaluation component, including the completeness of the materials and procedures for installation and operation of the component. Therefore, the initially developed prototype was progressively refined through the successive field trial and revision phases. It should be noted that the magnitude of the revisions to the component did not progressively decrease during each successive phase, as was predicted during the initial planning of the work unit, but, in fact, increased as more evaluative data became available to the developmental team. However, it should also be noted that the basic design concept remained relatively stable throughout the product engineering stage.

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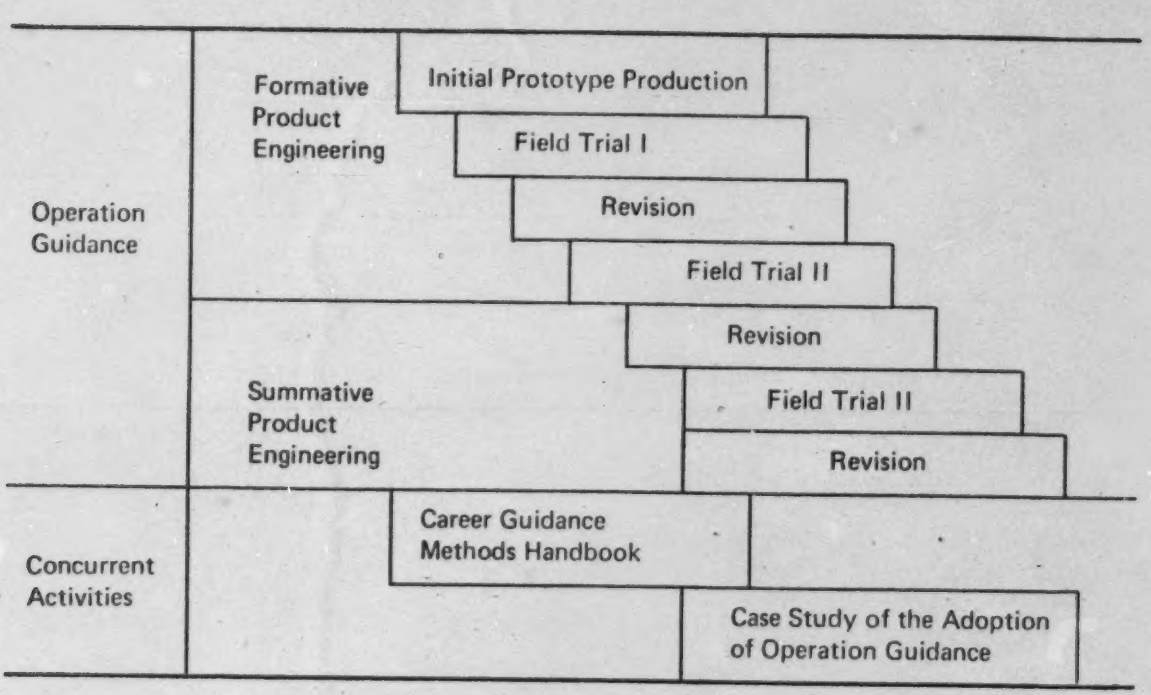
*In the final revised product, the term "module" was not used. Rather, the tasks were organized by function and assigned the name of that function, e.g., Resource Assessment, Data Collection and Tabulation. In all, there were eight functions, including orientation/organization.

Figure 5. General Product Engineering Phases and Concurrent Activities



Phases of the product engineering effort were overlapped to reduce the total developmental time for the operational planning and evaluation component of the CPSS. This strategy involved taking risks that could have been avoided if a linear sequence of product engineering phases was used. The most likely risk, and one that eventually became a reality, was concerned with the rate at which the schools using the product elements during the different field trial phases would progress. Participating schools could and did use the materials at their own pace. The rate of progress for a school seemed to be related to the conditions within the school and community that facilitated or hindered the adoption of the product, coupled with the degree to which the materials (and, implicitly, the strategy) were refined. School(s) in later field trials tended to progress at a more rapid rate than the school(s) in earlier phase(s). This phenomenon was primarily attributed to the refinements in the product elements used in the succeeding field trial phases, including those specifically designed to reduce the amount of time needed to use the planning and evaluation component. Therefore, the lead time between field trial phases progressively decreased during the work unit. This eventually eliminated the time needed for collecting evaluative data and making the indicated revisions to the product elements. Although the progressively decreasing lead time between field trials was anticipated, the rate of change was not expected. The second of two formative product engineering field trials was eliminated during the evaluation of the materials concerned with enabling the instrumental population to derive behavioral objectives from program goals and the site was redesignated a summative product engineering field trial site.

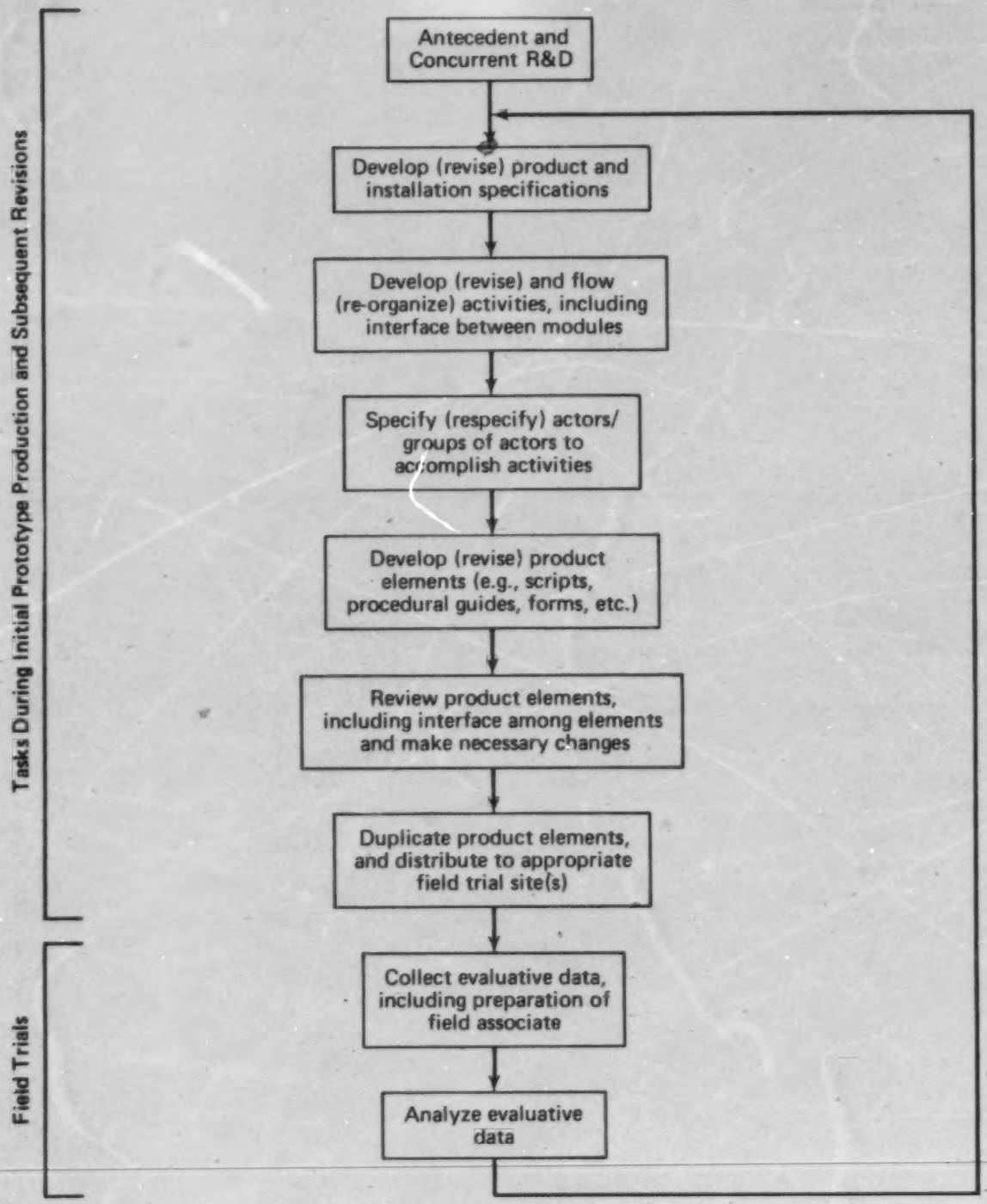
Although information from many sources, such as Herr and Cramer (1972), Hosford and Ryan (1970), Cook (1971), Stufflebeam (1968), and Super (1967), was used during the development of the operational planning and evaluation component, two are of special note. First, a handbook of career guidance methods (Campbell, Walz, Miller, and Kriger, 1973) was designed for inclusion in the component. Second, a case study of the adoption of Operation Guidance that was conducted concurrently with the product engineering work unit by another program within The Center for Vocational Education, provided evaluative data for revising the planning and evaluation component (Kester and Howard, 1975).

The remainder of this chapter is concerned with the major activities accomplished during the product engineering phase. Since some of the major activities were similar although differing in focus, the discussion will be divided into initial prototype productions, field trials of the prototype and collection of evaluative data, analysis of results and revising the component, and resources used during the product engineering phase.

B. Initial Prototype Production

The general procedure used to produce the initial prototype component is graphically shown in Figure 6. However, it should be noted that some of the product elements were not subjected to all of the developmental tasks due to time constraints during the initial prototype production and/or the two or three revisions. Trade-offs were made between perfection and fulfilling the delivery expectations of the schools participating in the work unit as field trial sites. That is, a balance had to be struck between personnel in a participating school losing interest in the use of the product because of inadequacies, such as typographical or technical errors, and not receiving materials so that they

Figure 6. General Procedure for Production of the Product (Only Major Path Shown) and Its Relationship to Field Trials


Tasks During Initial Prototype Production and Subsequent Revisions
Field Trials
Antecedent and Concurrent R&D
Develop (revise) product and installation specifications
Develop (revise) and flow (re-organize) activities, including interface between modules
Specify (respecify) actors/ groups of actors to accomplish activities
Develop (revise) product elements (e.g., scripts, procedural guides, forms, etc.)
Review product elements, including interface among elements and make necessary changes
Duplicate product elements, and distribute to appropriate field trial site(s)
Collect evaluative data, including preparation of field associate
Analyze evaluative data

could move on to the next task. In addition, decisions to by-pass developmental steps were complicated by the developmental team's concern for the internal validity and the eventual generalizability of the product.

The primary source for the development of the product and installation specifications (outcomes and outputs) for the planning and evaluation component was the procedural model developed by Campbell (1971). Campbell's model laid the general foundations and described the general procedures for systematic planning and evaluation of career guidance programs. Initially, the specifications were stated in relatively general terms, then progressively were made more detailed during each revision cycle as uncertainties were alleviated.

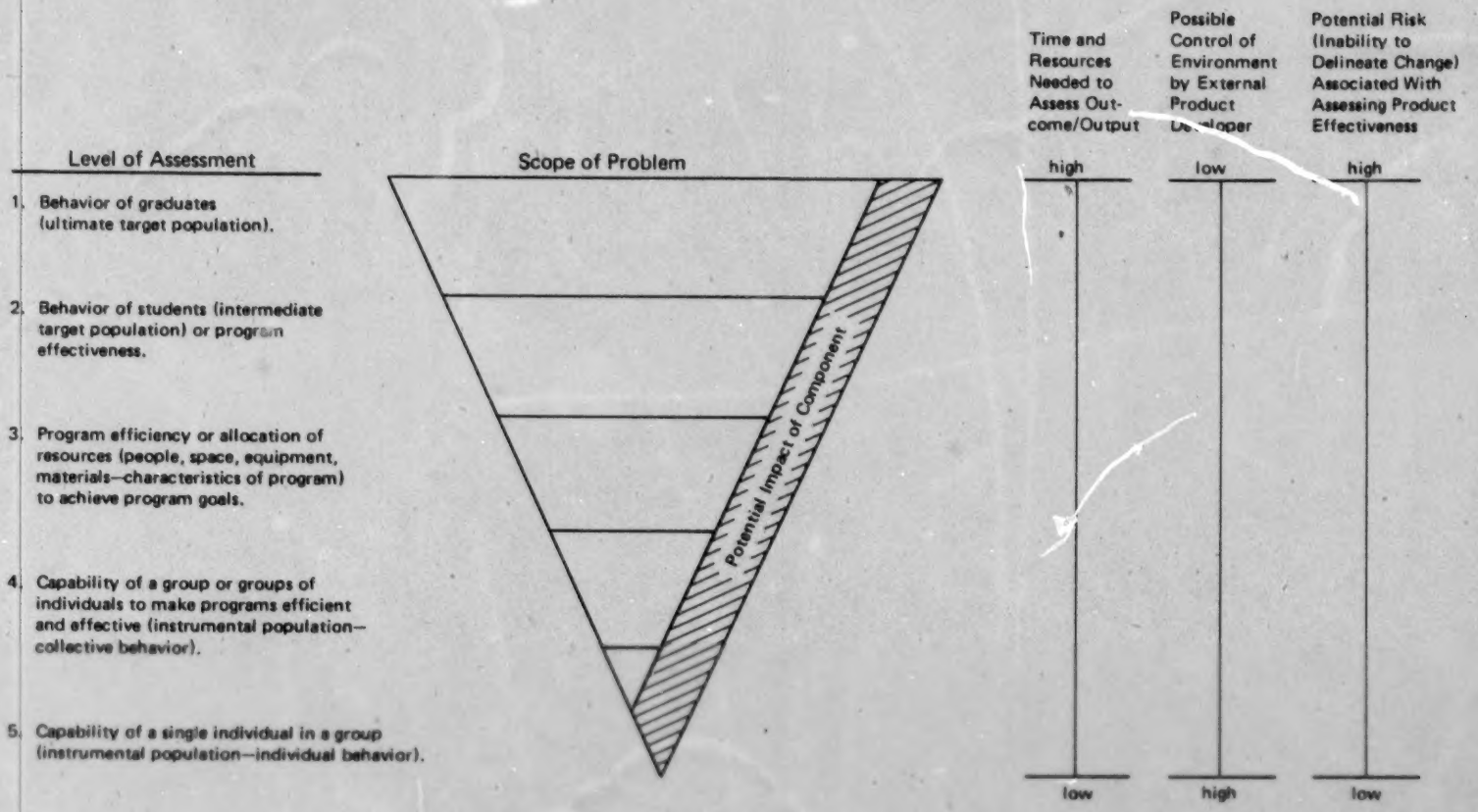
Product and installation specifications are interdependent, and it was often difficult to decide whether a desired outcome or output should be classified as a product or installation specification. However, the bifurcation of desired outcomes and outputs, that is, the identification of the indicators of desired terminal states and the indicators that enable attainment of the terminal states, facilitated the evaluation of the product's performance.

The distinction between product and installation outputs and outcomes also served to highlight the importance of the adoption of the planning and evaluation component by the instrumental population. That is, concerns, such as the cost of purchasing and using the product by a school and the ease, or difficulty, with which the instrumental population is able to accomplish the many planning and evaluation activities, were as instrumental to the success of the product engineering effort as were the technical considerations of program planning and evaluation. From the perspective of evaluating and revising the product, too, observations on the achievement, or non-achievement, of installation specifications should provide insight or rationale for less than desired achievement of product specifications.

Figure 7 graphically illustrates the different levels of the problem and associated target groups that could have been addressed by Operation Guidance (and, ultimately the CPSS) and, therefore, the levels at which the product should be assessed. The paradigm also shows the potential impact which the product (or, for that matter, any externally developed product) could have on the ultimate problem, occupational floundering. Implicit to the hierarchical arrangement of the problem is the reduction of deficiencies at lower levels before any long term amelioration of the problem at any next higher level is possible.

Ideally, the target population should have consisted of, intermediately, students in high schools and, ultimately, graduates. The high schools may have three (10-12) or four (9-12) grade levels and are located throughout the United States. The impact, the reduction of floundering behavior, on this target could not, however, be readily or fully assessed for two main reasons. First, there was a lack of adequate theory and technology to do so, e.g., extant vocational or career development theories were not sufficiently specific and validated to serve as a basis for program development or assessment. Recently emerging technologies for the assessment of student achievement of career development behaviors are clear examples of these deficiencies. Second, the state of the art for evaluative methodology and, ultimately, research methodology was inadequate for assessing whether the reduction in the ultimate floundering behavior in students is attributable to a single treatment, such as a career guidance program. Further, those methodologies were inadequate for accomplishing such an assessment within the time period for and resources of the product. It is doubtful that the effects a career

Figure 7. Levels at Which the Operational Program Planning Component of CPSS, an Externally Developed Product, Could be Assessed and Associated Risks and Costs for Ambition (Not to Scale)


Level of Assessment
1. Behavior of graduates (ultimate target population).
2. Behavior of students (intermediate target population) or program effectiveness.
3. Program efficiency or allocation of resources (people, space, equipment, materials—characteristics of program) to achieve program goals.
4. Capability of a group or groups of individuals to make programs efficient and effective (instrumental population—collective behavior).
5. Capability of a single individual in a group (instrumental population—individual behavior).
Scope of Problem
Potential Impact of Component
Time and Resources Needed to Assess Outcome/Output
Possible Control of Environment by External Product Developer
Potential Risk (Inability to Delineate Change) Associated With Assessing Product Effectiveness
high
low
low
high
high
low

guidance program could have on an individual as opposed to the combined effects of the remainder of a school's program, the student's home life, and other external considerations such as the labor market, could be adequately isolated. Even if it were possible to isolate the effects of all other independent variables, it could require, at a minimum, a longitudinal study to determine the degree to which a career guidance program would impact on an individual.

Since the two major constraints above could not be overcome, it was necessary to focus at an intermediate level or levels, i.e., assessing program characteristics and the behavioral change of an instrumental population or subpopulation with the hope that these characteristics can contribute to the reduction of the ultimate problem. Even the former level of assessment involved risk; that is, possible failure to show effects, since the degree to which the environment could be controlled by an externally developed product is, realistically, relatively low.

C. Collection of Evaluative Data

In order to determine the effectiveness and efficiency of the operational planning and evaluation component, or, more aptly, modifications that needed to be made to the evolving package, six comprehensive high schools located in five states, their school districts (local education agencies), and state educational agencies voluntarily participated in the work unit as field trial sites. To the degree feasible, the participants were located throughout the continental United States, among other considerations, to facilitate the dissemination of the product during subsequent stages of the CPSS program. However, two schools were located in one local educational agency at the request of their local and state educational agencies. The six schools, in alphabetical order, are: Agua Fria Union High School, Avondale, Arizona; East Bank Senior High School, East Bank, West Virginia; Walter F. George High School, Atlanta, Georgia; Jesse H. Jones Senior High School, Houston, Texas; Sunset High School, Beaverton, Oregon; and Booker T. Washington High School, Atlanta, Georgia. The length of participation for these six schools was as follows:

1. First formative product engineering field trial site – three academic years.

2. Second formative product engineering field trial site – two and one-half academic years.

3. Four summative product engineering field trial sites – two academic years.

The six schools may generally be described as follows: Three of the schools had grades nine-twelve and three had grades ten-twelve. The average number of students for the six schools was 1,411, ranging from 890 to 1,950. The overall racial/ethnic composition of the students was 53 percent white, 42 percent black, and 5 percent from other groups. The average number of teachers in a school was sixty-six, ranging from forty to ninety-three. The average number of counselors was six, ranging from two to twelve (average student/faculty ratio was 21:1; the average student/counselor ratio was 235:1). All six schools were in Standard Metropolitan Statistical Areas (SMSAs). Three of the schools were inner-urban, one in the suburbs, and two in the outlying area of the SMSA.

The following is a general description of their participation in and the procedures for the collection of evaluative data on the different versions of the planning and evaluation component. Before

proceeding, however, it should be noted that practical considerations of working with high schools and local and state educational agencies who expended relatively large amounts of their resources to use the evolving product often outweighed the need or desire for methodological elegance during the successive rounds of evaluation and revision of the planning and evaluation component. Although the use of field trial sites was to collect evaluative data from the development team's perspective, the schools perceived their participation in the work unit as a means to upgrade their career guidance programs. Therefore, the developmental team was obligated to provide first-hand assistance to a participating school to accomplish prescribed planning and evaluation tasks when the elements of the component were not able to do so. The evaluative data received from the participating schools also were at times less than ideal because of the additional resources that would have been needed to collect the desired information.

Site Identification and Preparation

Extensive lead time was needed to identify, select, and prepare the comprehensive high schools who served as the product engineering field trial sites. Although the amount of time varied significantly, approximately nine months were needed from initial planning to have a site ready for initial participation in the field trials. Potential field trial sites were identified by inquiries received from schools and local and state educational agencies regarding participation in the work unit. These inquiries were generated by varying means, including a summary report of the procedural model (Campbell, 1971b). Other means of dissemination, such as a journal article (Campbell, Suzuki, and Gabria, 1972) and papers presented at meetings of professional organization, resulted in more inquiries from interested agencies in the field. The inquiring organizations were considered as potential trial sites. Based on readily available information, each candidate was compared to a set of criteria developed by the development team. In general, these criteria were concerned with the following general conditions:

1. The school should be located in a Standard Metropolitan Statistical Area (SMSA). Available demographic information would be more extensive for an SMSA than non-SMSA areas.

2. The school should have at least 200 students per grade level, two or more counselors, and forty-five or more teachers. Although schools with smaller populations could probably use the evolving product, the development team felt that it would be more advantageous to minimize the amount of work that any individual would have to do during the field trials.

3. The students, teachers, counselors, and administrators in the school and their local and state educational agencies should be committed to the participation in the field trials. The participants needed to commit a relatively large amount of resources in terms of time, space, equipment, and materials to their use of the evolving package. Also, malfunctions in the product were inevitable regardless of the effort of the development team to minimize them.

4. The school should be a relatively stable setting in which to evaluate the performance of the evolving product. Instability, such as teacher or student unrest, would make the collection of evaluative data more difficult than it already was.

5. The school should be readily accessible by commercial air or private ground transportation. This condition was of particular concern for formative product engineering field trial sites due to the relative crudeness of the initial versions of the evolving planning and evaluation component. The development team therefore needed the capability to access a site with minimal lead time needed should a serious problem with the use of the product arise.

6. The participants should be willing to discuss with visitors their participation in the work unit.

In addition to identifying candidates that were deemed best suited to serve as field trial sites, alternate sites were also identified in the event that a candidate was found to be unsuitable or unwilling to participate in the project.

The school district and state department of education in which each candidate site resided were contacted to ascertain their continued willingness to participate in the field trials under the conditions specified by The Center and to acquire permission to conduct an initial site survey. An initial visit was then made to each site. During this initial visit, key decision-makers in the state and local educational agencies were provided information on the field trial and key personnel were identified and contacted to provide input for joint agreements. An agreement was then developed for each field site.

Site Survey

Baseline data on each field site were collected for recycling and implementing decisions and/or consumer information. A portion of the information was acquired through the needs and resource assessments that were conducted by personnel at the field sites during their normal use of the component. Instruments and procedures for these assessments were developed and validated prior to and during formative product engineering.

Additional baseline data were collected after all agreements had been signed. During this site survey, information was collected on the following: characteristics of the student population (e.g., racial and ethnic composition, social environment, academic grouping), characteristics of the school (number of grades, curricula, demographic characteristics of the surrounding community, managerial structure), and faculty and staff characteristics (number and type of faculty and staff members' experiential background, such as experience with behavioral objectives).

Site Preparation

Personnel at the field sites were briefed by the development team on their part in the field trials. A general briefing was given to the entire faculty, student leaders, and staff at each test site. Special briefings were given by the team to members of the working groups (Steering Committee, Advisory Committee, and task forces) at each site. These working groups were briefed immediately after their formation and prior to their initial use of product and installation materials and procedures.

Procedures

During the product trial, the product was used by personnel at the field trial sites with as little intervention and assistance by project personnel as possible. The development team attempted to be

as unobtrusive as possible during the field trial in order to minimize contamination of the evaluative data; however, team members observed the performance of the personnel in the schools while they used the product and installation packages. The team also interviewed selected personnel and students at the field trial sites and received all outputs developed by the participating schools as a normal function of using the evolving product.

Field Associates

A field representative, called a field associate, was located in each field trial site. The field associates were employees of the local educational agencies in which they worked, but were, in general, released full-time to assist The Center for Vocational Education with the field trials, i.e., they had clearly identified time to participate in and take directions from the development team for all matters related to the field trials. A position description for the field associates is given in Appendix F. Procedures for the identification, selection, and hiring of field associates depended on the agreements negotiated with and the personnel policies and procedures of the participating school districts, but the following general procedures were used:

1. The participating school districts identified potential applicants for the field associate positions using criteria provided by The Center.

2. The team leader or his representative interviewed the applicants and identified the candidates best suited for the positions.

3. The team leader recommended to the participating school districts the candidates be placed in the field associate positions.

The field associates received training prior to taking an active role in the work unit. After initial preparation, the field associates required additional preparation in order to maintain operational effectiveness. As an example, during the initial preparation periods, the field associates became familiar with the procedural model, its general purpose, the planning and evaluation component, and the evaluation plan. During the conduct of the field trials, field associates became conversant with the actual content and configuration of the total product and each product element. Initially, care was taken to insure that the field associates performed as members of the development team and not as a part of the school's staff, since a field associate could become co-opted by the school and, could, even unintentionally, invalidate evaluative data. Toward this end, local educational agencies were encouraged to place individuals who were not a member of the participating school's faculty in the field associate positions. However, this view changed when it appeared that individuals familiar to the faculty in a school took less time to become operationally effective in the school than those who were unfamiliar to the faculty. At times, too, the field associates were encouraged to become co-opted by the participating school to facilitate the use of the evolving product by the school.

Instrumentation

Evaluative data were collected in a variety of ways. The primary source of information on the effectiveness of the operational planning and evaluation component of the CPSS was the actual outputs produced by members of the instrumental population in the participating high schools as a result of their normal use of the evolving package. These outputs are identified in the product specifications,

such as program goals, behavioral objectives, career development unit plans, etc. Formats or forms were provided in the packages that the participating field sites used to facilitate their documentations of results and conclusions. Also, other information, e.g., students' needs for career development, community and school resource characteristics, etc., which they documented in order to acquire the primary outputs was also provided to the developmental team for evaluative purposes.

Criterion-referenced tests were also built into printed instructional materials. In general, printed instructional materials contained self-administered, diagnostic pretests and mastery posttests. Directions for administering and scoring the posttests were also contained in the package.

As mentioned previously, another program The Center for Vocational Education conducted was an in-depth case study of the adoption of the operational planning and evaluation component of the CPSS as an innovation (Kester and Howard, 1975). Much of the information that they needed for their study had already been or was in the process of being collected by the project team for the purpose of revising the product. Additional information that the staff of the case study collected was provided with recommendations to the development team for the planning and evaluation component. This latter information was concerned with issues such as the perceived complexity of the innovation and the acceptance of the program planning and evaluation component.

Other means of collecting evaluative data are listed below:

1. Product Memorandum were used by field associates to document apparent deficiencies in or possible improvements that can be made to product elements.

2. Project Logs were used by field associates to record project activities at their sites. The Project Log consisted of the Daily Log and Weekly Activity Summary.

3. Time Logs were used to collect information on the amount of time an individual in a participating school spent working with the program planning and evaluation component.

4. Budget Report was used to document monetary expenditures, especially local contributions, made by each field site.

5. Individuals using the materials were encouraged to comment directly on product elements regarding their opinions on the materials.

6. Observations by the development team members, including field associates, of the actual use of the product elements provided information on the performance effectiveness and efficiency of the product. Although initially using interview schedules, the interviewer investigated in-depth system deficiencies that became apparent. When subjects at the sites completed major tasks, they were interviewed by team members. For each product element, special instructions on the collection of evaluative data were developed for the field associate. When feasible, different team members or more than one team member visited each participating school to facilitate the collection of reliable information through observational techniques.

7. Meetings of working groups were tape-recorded (audio) when feasible.

Ideally, it would have been most desirable to assess every product and installation specification with the most sophisticated techniques available. However, it would require extensive developmental and administrative time and effort to do so. It would have also required an unreasonable amount of time for the subjects to participate in the resulting data gathering effort. Therefore, assessment was subjected to "cost-benefit" considerations, just as all other developmental activities were.

The use of only two field sites during formative product engineering severely delimited the generalizability of the findings. The product was and still is highly complex and contained a large number of product elements. System malfunctions were expected even though much effort was expended during initial production and revision to make the product elements as effective and efficient as possible.

D. Revision

The revision of the evolving operational planning and evaluation component of the CPSS involved the analysis of evaluative data and then the use of the findings to make appropriate modifications to the package using the general procedures graphically shown in Figure 5. (p. 22). The evaluative data and information received from the field trial sites were compiled by the development team members in a variety of ways. As an example, numerical data were tabulated, and observational data summarized. However, the raw and summarized information was stored until ready for use. Questions that were asked during the analysis of data were as follows:

1. Has evaluative information been adequately collected, documentéd, and validated? Has evaluative information been utilized? Has the data been collected and stored in a timely, efficient manner? Has the field associate been co-opted?

2. Have the product and/or installation specifications been met? If yes, was it met in the most efficient and effective manner feasible?

3. Does the product element or set of product elements function as designed?

4. Is the system, subsystem, or product element malfunction localized (i.e., a problem unique to one site) or is it generalized (i.e., a problem encountered at all sites)?

5. How disruptive did the system, subsystem, or product element malfunction? Can the people at the site tolerate the malfunction?

6. Are the product and/or installation specifications valid?

7. Is the procedural model or the implementation of the procedural model valid?

8. What are the consequences (e.g., continued cooperation from school, district, and state) if the modification is or is not made?

9. What is the estimated cost for making the modification?

a. What manpower resources would be needed?

b. What support services would be required?

10. Will the modified product element require field trial? If so, how should it be retried and how much will the retrial cost?

11. What are the consequences if the field trial is terminated before all product elements have been tried?

In addition to the development team's analysis of the evaluative information, several critical decision points which occurred during the work unit were selected as candidates for external evaluation through The Center for Vocational Education's Assessment of Internal Decision Event (AIDE) strategy. The Center's Evaluation Division developed a separate detailed plan for an external review of the evaluative information. An example of a plan is given in Appendix D. Three outputs from the schools participated in the summative product engineering field trials were selected for external review. These were: (1) statement of student needs for career development, (2) behavioral objectives derived from program goals, and (3) career development unit plans. The former two primary and their associated outputs were subjected to external review. The last outputs from the school were not reviewed by external evaluators and only by the development team because of the lack of time to do so. That is, revisions on the product elements concerned with the development, implementation, and evaluation of career development units were being finalized for the product field test of the component before an external review could be organized.

IV. DESIGN DECISIONS

At the beginning of the product engineering phase the developers had as a starting point the procedural model that is discussed on page 2 of this report. The objective was to develop a useful product that generated student-oriented results in the high school.

In the realm of "procedural politics" all dilemmas between methodological elegance and practicality were decided in favor of practicality or what was perceived to be relevant and practical by the instrumental population. Concerns such as the amount of time available to accomplish tasks by and the varied levels of expertise within the instrumental population, administrative constraints, leadership style, etc., indicated the need for a highly detailed package. Throughout the product engineering phase there appeared to be the positive relationship between the amount of detailed material and the efficiency and effectiveness of the program developed by the instrumental population.

Another general concern that occupied the product engineering phase was the ethical commitment on the part of the developers towards the field sites. In that the six schools had committed many people and considerable resources to the field trials, the developers felt obliged to point out potential pitfalls and, if necessary, suggest remedies to problems that were directly associated with the product. It should be noted that in all cases advice from the developers was not obligatory. Final resolutions to problems rested with the school. The developers felt it was more realistic, when necessary, to help the schools get results with the product rather than insist on "pure" data from the field thus risking abortion of the field trial at a given school.

The remainder of this section will highlight the major product design concerns and considerations during the evolution of the field test product. In general, the data received from the four to five summative product engineering field sites indicated that the majority of the materials and procedures were effective and efficient. These findings were confirmed by external evaluators. Although such positive information was gratifying to the developers, of greater significance was the negative information that indicated a need for product modification. To the degree possible the product malfunctions were ameliorated. However, not all indicated changes were made due to limitations on project resources and the time needed to affect the changes. For example, a resource pool of career development behavioral indicators and a full computer program for processing survey data were not developed.

The major product design concerns are in the following categories: specifications, organization, needs assessment, resources, behavioral objectives, CDU plans, installation, and field personnel.

Specifications

The product and installation specifications evolved over the duration of the project. Regeneration resulted in greater comprehensiveness, specificity, and sophistication of the specifications. Admittedly, early specifications, especially product specifications, were overly general and ambiguous. There are two primary reasons for this. First, less than nine months were available for the initial planning and the developing of first materials needed for field trials. This was coupled with a low level of resource allocation to

the project during this period. Second, there was a suspicion among the developers that they did not know enough about high schools, the way they operated, their inhabitants, and the pressures and constraints placed upon them. Most critical was the potential for change which was directly related to each school's uniqueness. Therefore, there was a concern about spending too much time on planning the product with a distinct possibility that modification of the initial conceptualization was inevitable, coupled with a concern that overly specific specifications would become "chisled in granite" and would be difficult to change in response to the field experiences.

The current product specifications denote significant changes from the earlier versions in that there is greater specificity for both the product and installation concerns. Basic concepts and general outcomes did not change over time even though they became more concrete. As part of the development of product specifications, often installation concerns outweighed actual product concerns in an attempt to keep the field trials working. As a check on the validity of the evolving specification, the developers, periodically, had both the set and parts reviewed by external evaluators.

Organization

Initially the planning, evaluation, and installation tasks were organized linearly and grouped into modules. (The number of modules varied from five to ten.) However, evaluative data tended to indicate that completion of modules rather than the key outputs described in the product specifications became the goal of the working units within the school. Also, the modular design appeared to work against the continuity of the process. Schools seemed to develop a "modular mentality" rather than realizing the modules were but a part of a larger effort. Therefore, in the final version all references to modules were eliminated, and the process focused on tasks. On the other hand, the modular designation and linear development was a useful managerial device for the developers given the amount of time and resources available to the development staff at CVE.

A major complaint from nearly all Steering Committee members of the participating schools was the amount of time that transpired between initiation of the effort and the first "concrete" results. In the final version of the product the concurrent accomplishment of tasks by the instrumental population was used to a greater degree than initial versions. Although somewhat increasing the difficulty of coordinating the work being done in the school, it was hoped that the accomplishment of concurrent tasks would accelerate the process and, therefore, be more conducive to maintaining and building interest in the use of the product. However, the degree to which concurrent tasks were developed was limited by the amount of project resources and available developmental time. If time had permitted, a special option would have been developed that would enable the school to immediately upgrade one or two elements of their existing career development program, so that positive results could be shown quicker during the first year. At the same time, other task forces or working groups would progress through the normal evaluation decision-making process that is prescribed in the final version of the product.

Another way in which this problem was addressed was to delegate many task force responsibilities to the Steering Committee to promote continuity and coordination of the effort. For example, the early procedures called for an ad hoc group to interpret survey data into goals. In the current version, the Steering Committee, the group with greatest product knowledge, addresses that task.

Needs Assessment

One of the most difficult tasks during product engineering was developing materials and procedures for the instrumental population to collect information on student career planning and development needs. A search of the literature indicated that in assessing the career development behaviors of students, such as those being conducted by Crites (1969), Super (1957), and Westbrook (1971), were under way and had promise for inclusion in the product. However, it was later learned that the instrumentation that was being developed was inappropriate for program development because of a variety of reasons, such as inappropriate population and insufficient specificity of the information provided, including inappropriateness of the scoring (norm-referenced as opposed to criterion referenced).

Because of the need for a data base upon which to build the program and, when necessary, to "prove" that student needs were not being satisfied (i.e., a "baseball bat" to get the attention of teachers, parents, and administrators), project staff with the assistance of the participating schools developed a set of assessment instrumentation. Following are some experiences and observations from the development of the instrumentation.

Career development skills for students may be technical or non-technical. Technical skills are most often associated with occupational education. Non-technical career development skills can be displayed as in Figure 8.

Experience at the field sites led the developers to believe that the information collected on the surveys must be specific enough to yield concrete goals. Self-awareness, socioeconomic, and decision-making and planning skills that were included in the earlier versions of the survey instruments seemed to be difficult for the instrumental population to develop into student oriented, non-process kinds of goals. Other skills appeared to be more specific in terms of what the students could or could not do, thus providing a more concrete base for goal development. Additionally, since the subject materials were directed towards the high school it seemed more reasonable that career implementation skills were of a higher priority, particularly for juniors and seniors. Thus, the five areas of career development skills addressed in the surveys were: (1) occupational information, (2) educational information, (3) educational placement, (4) school and community resource exploration, and (5) job placement. The areas of self-information, socioeconomic information, and decision-making and planning, though not included in the surveys, were considered enabling skills that students could acquire regardless of the goal selected. The area of non-technical vocational adjustment had only one goal representing it and so was included in the area of occupational information on the survey.

There are basically five ways of obtaining information from students regarding their career development needs. The ideal method is to assess through actual performance whether the student can perform a certain task such as decision-making. Second, the student can be asked what he or she has done. Third, the student can be asked whether he/she can perform a task or can acquire certain information. Fourth, the student can be asked whether he/she needs assistance with a specific task or certain information. Fifth, the student can be asked whether he wants assistance with specific tasks or certain information. The third level of assessment, that is, student's self report on whether he/she can do specific tasks or has certain information was used as a means of collecting information upon which to plan a school's career guidance program. Time and resources available to the project staff prevented the development of instrumentation at the first level, the assessment of actual student

Figure 8. Non-Technical Career Development Skills

<table>
<tr><td>I. Awareness and Exploration Skills</td><td>Occupational Information</td><td>Socioeconomic Information</td><td>Self Information</td><td>Educational Information</td><td>Community and School Resource Information</td><td rowspan="2">Decision-Making and Planning</td></tr>
<tr><td>II. Implementation Skills</td><td colspan="2">Educational Placement</td><td>Job Placement</td><td colspan="2">Vocational Adjustment</td></tr>
</table>

performance. Initial versions of the instrumentation focused on a student's self report of felt needs and wants or desires for assistance. However, information gathered during interviews with students who had responded to the instruments tended to indicate that a significant number of students did not indicate a need for a skill or information or desire for assistance if they did not know about the necessity for the skill or information. Although this was at times a function of wording and/or ordering of the items, interview data tended to indicate that some students did not want to state a need or desire for assistance if it was to be provided by a school. This was particularly evident when the assistance was related to social or personal problems. All in all, in the earlier versions of the instrumentation items often appeared statistically reliable yet on further evaluation through individual interviews the information collected was often apparently unreliable.

Admittedly, it may not be possible to formulate a truly comprehensive career development program with a survey of just a limited number of skills. It should, however, function as the basis or foundations for a comprehensive program. The skill areas were also incorporated to help organize the program while the specific skills in each area would be used to determine student deficiencies. Another reason for focusing on skills is that knowledge changes more rapidly than skills. Any knowledge test would have to be continually updated.

The relative brevity of the questionnaires for collecting information from students, faculty/staff, parents, and graduates is a function of the amount of time that would be needed by them to complete the instrument. As an example, when administered to students it was highly desirable to have the complete administration time, that is, from the time they are released from classes to the reading of instructions, the responding to the instrument, collection, and sending the students back to the room, fall within a school period of approximately fifty minutes. Teachers did not appear to appreciate having students participate outside of this time construct since it tended to cause confusion in the school. As far as teachers, parents, and graduates, the longer the instrument the less likely they would respond to it. Also, the developers found that if the student survey was too long, then unreliability appeared to be greatly increased.

Terminology was also a problem. Many students equated jobs and occupations. As for careers, only "doctors" and "teachers," in other words those who go to college, had careers according to students. As a result, only the word "job," the most generally understood term, was used on the student survey. In the tabular display of data, the correct terminology was reinstated.

Data Collection

In the early administration of the survey, a systematic sample of students was drawn. However, experience demonstrated that tapping the whole student body facilitated administration. Since all students are involved, surveys could be administered in homerooms or a comparable common period. Sampling students would cause commotion in singling out students, not to mention the problems of following them up if they missed the initial administration. Another consideration for surveying the entire student body was to encourage student interest in career development activities.

The developers wanted to create a computer data processing subsystem for the needs assessment but did not have adequate resources to do so. Written procedures for manually tabulating data were given first priority since many schools do not have computer capabilities. The procedures are arranged to yield survey item responses in an eighty column format. If a school has computer facilities available, then it should be quite easy to adapt the survey data for computer processing.

Goals

Probably the most important issue in the needs assessment part of the product was the translation of data into goals. Initially, the developers used a dual approach for this translation. The instrumental population was given a highly structured decision-logic table to arrive at goals for half the survey items. For the other half, they were presented the data and with little decision-making structure were asked to draw conclusions from the information. While the highly structured approach generally yielded more valid results, the committees were very uncomfortable handling data in a highly structured way for a variety of reasons, including information not accounted for by the product. Given no structure to handle the data, illogical need statements often concluded from the existing information. To facilitate the probability that logically derived goals would come from the data, the developers sought to strike a compromise between a highly structured decision-logic table and no structure. This resulted in the survey items being stated so a "yes" or "no" response was required. The items were so worded that a "no" response indicated a self-report of a career development deficiency. Thus, goal statements could be derived by simply rewording the survey item.

Resources

The issue of resources available to support program development was and is of prime concern. Since a basic tenet was the efficient use of resources, initially, schools were encouraged to collect and consider all resources when making decisions about priorities and selecting goals for implementation. This process tended to create an information overload for those trying to assign priorities to goals. This overload appeared to result in a reversion to biases or personal concerns rather than selection of priorities based on available data. As a compromise, procedures were revised to consider ranking goals based only on the survey data. A relatively simple accounting structure for resources was devised to facilitate allocation of resources and is brought into the implementation process rather than when priorities are selected. This was done to distribute the use of information more evenly throughout the developmental process.

Behavioral Objectives

The behavioral objectives section of the product presented content and procedural problems. Instructional objectives relating directly to career development behavior of students were not available. A framework for constructing technically accurate, student oriented behavioral objectives was provided for the instrumental population. Examples for the instrumental population to follow were career development oriented. Had there been sufficient resources, a pool of career development objectives would have been developed to facilitate the writing of objectives in the school.

Procedurally, the first way objectives were written for the school was by an ad hoc task force that wrote all objectives for all goals. This tended to create a quality control problem in that the task could be very overwhelming for one group. Also, those charged with the implementation of the objectives tended to feel that those objectives were unrealistic, uncomprehensive, and incomprehendible. In the field test version, the school organizes a smaller group of persons who would serve as a permanent behavioral objectives task force. They use semi-programmed instructional materials to upgrade their expertise, then act as consultants to persons who are responsible for formulating career development units around a goal or set of goals.

Career Development Units

How to plan career development activities posed a special design concern. The career development unit is intended to be a synthesizing activity that brings needs and resource assessment data, goals, and objectives into meaningful form for students. It was not the developer's intention to provide content for any activity but to provide a framework on which to build career development activities. Early versions were sketchy in directing the form of the career development unit to allow maximum flexibility for school personnel to create activities. More structure appeared to be needed as the first trials resulted in floundering by CDU coordinators. The developers refined the structure by stressing the need to orchestrate the development of units with resources to maximize the effect on students. Directions for creating a career development unit (CDU) plan became more detailed to preclude omitting important consideration to increase the probability of attaining maximum impact. A CDU management plan was built to help schools implement multiple efforts in a developmental mode. Also built into the framework is an evaluation scheme for each unit which may be used by the person leading the unit.

In providing a framework for CDU development, perhaps the greatest obstacle to overcome was and still is the perception that the CDU is not an end in itself. The mechanics of building a good CDU could be overwhelming if not managed properly. Career development units should be designed in a systematic, comprehensive way in order to effectively upgrade a school's career development program. Nevertheless, a CDU plan serves to increase the probability of attaining goals rather than guarantee success.

Installation Concerns

There are some overall concerns about the design of the product and how well it functions in the school environment. The size and scope of the project has a potential for making major changes in the school with regard to career development activities. The specified committees necessitated the involvement of many faculty, staff, and student members of the school over a period of time. While the developers recognized the principal as the key policy maker, it was apparent that a majority of the staff and students was needed to support the project. As prerequisite to participation the developers recommended a 70 percent or neutral vote from staff and students.

Another realistic problem that had to be dealt with involved immediate results. The instrumental population became easily frustrated by the amount of planning information that had to be gathered. It was important to develop student activities as soon as possible to maintain the support of the school. Because the product was not fully developed this did not occur at the product engineering sites and tended to erode support in the school. In the field test version, the product is designed to enable a school to produce student career development activities during the first year with the caveat that systematic planning and evaluation is the overall goal of Operation Guidance.

Three other concerns peculiar to building the product in the school setting are worthy of note. The developers had to infuse into the procedures an adaptability factor to attempt to overcome potential resistance to the product being placed on the school from an outside agency. Thus, the product holds to the idea that local needs are best ameliorated by local solutions. Audiovisual elements supplementing the procedures of the product were difficult to develop. School personnel often reacted negatively to crude prototypes of sound slide presentations. Their concern for technical quality or

"slickness" tended to distort the message. Production costs, however, prevented heavy investment in the technical quality during the early development stages. Lastly, throughout the product engineering phase, holiday and summer vacations had a near deadly effect on the sites' progress with the product. Key activities of the product, the developers found, had to be avoided immediately before and after long breaks.

The definition of terms and responsibilities created special problems. The product treats the improved career development of students as a goal for all professional educators, not just guidance counselors, although counselors are viewed as key leaders because of their expertise and existing involvement in the career development of youth. In some instances counselors felt threatened that others would do their work. On the other hand, teachers could not see doing what they perceived as the counselors' work. These cannot be resolved by the product itself except by communicating as clearly as possible its theoretical approach. The field test version, hopefully, addresses this concern better than did the earlier versions of the product.

The developers were also concerned about the availability of technical advice. The intent of the product is to be self installable and function without the developers. In each of the six product engineering schools a full-time person, trained by the developers, was employed to monitor and lend technical guidance to the school. In effect, this person became an advocate who was often a key to the success of the project. Generally, the credibility of the project depended on the perceived credibility of the field associate. In instances where the person was new to the school, credibility took longer to establish.

The developers realized the full-time field associate would not be a reasonable requirement once the product was developed. Through the experience of these six people, the intent was to streamline the product so a person already in the school could manage the project on a half-time basis. The project coordinator's position description became more concrete over time and can be examined in Appendix G.

Throughout the product engineering phase the developers sought to build a useful product for helping high schools improve the career development skills of their students. With the help and cooperation of many people at the local, district, and state educational levels, it was possible to build, from the procedural model, a practical comprehensive career development planning and evaluation package. Although much had been accomplished during the three and one-half years of the work unit, the "ultimate" product was not attained due to the common lament of developers, insufficient resources. The most difficult decision of the developers was to release the product for utilization in the next developmental phase, the product field test.

V. A NATIONAL FIELD TEST

Design and Schedule

Final revisions to the operational planning and evaluation part of the CPSS product were made from November 1973 through September 1974 in preparation for a national field test of the prototypic product. The field test is scheduled to last from September 1974 to June 1976.

Preparation for field testing began in February 1974 with the development of site selection criteria. Given budgetary limitations, it was determined that from ten to twelve states with three to five schools each representatively distributed across the country should constitute the sample. The initial sample was to allow for attrition among the participating states and schools.

Plans called for each chief state school officer, directors of vocational education, and directors of guidance being notified of the pending field test even with the relatively late request for participation in March 1974. Twenty-nine states positively responded to the initial invitation. From that group twelve states were selected by May 1974, based on geographical and population characteristics. These twelve states are: Alaska, Arizona, Kentucky, Michigan, Mississippi, Missouri, Montana, New Hampshire, North Carolina, Ohio, Utah, and Washington. A lack of resources prevented a wide-scale extensive field test. Initially, these states identified forty-nine schools to participate in the two-year field test.

Field Test Purpose

It is anticipated these schools will generate not only useful data for CVE, but meaningful career guidance activities for their students. Although evaluative data for making final revisions to the program planning and evaluation strand will be collected during the field test, the actual revisions, if needed, will not be effected until the final synthesizing activity of the Career Planning Support System. Once the strands presently being developed are integrated, the whole Career Planning Support System product should be available in late 1976.

For readers who would be interested in a general overview of the product and its development, A General Report of the Product Engineering of A System for Upgrading High School Career Planning Programs is available from Product Utilization Section, The Center for Vocational Education, The Ohio State University, 1960 Kenny Road, Columbus, Ohio 43210.

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APPENDIX A

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Dick Olson, Coordinator of Guidance, Beaverton Schools
Thomas Williams, Specialist, Career Exploration Programs, Oregon State Department of Education
The faculty, staff and students of Sunset High School

Texas

John E. Codwell, Superintendent, Area 4, Houston Independent School District
W. H. Fitz, Eduational Program Director, Texas Educational Agency
George G. Garver, Superintendent, Houston Independent School District
John R. Guemple, Associate Commissioner for Occupational Education and Technology, Department of Occupational Education and Technology, Texas Educational Agency
Bill Lovelace, formerly Educational Program Director, Texas Educational Agency
Arthur Pace, Principal, Jesse H. Jones High School
Letitia W. Plummer, Director of Guidance, Houston Independent School District
J. B. Whiteley, Supervisor, Occupational and Adult Education, Houston Independent School District
The faculty, staff, and students of Jesse H. Jones High School

West Virginia

David Acord, Assistant Superintendent for Vocational and Career Education, Kanawha County Schools

Clarence E. Burdette, Assistant Superintendent, West Virginia State Department of Education

Fred Radabaugh, Director of Guidance and Social Services, Kanawha County Schools

Glenn E. Smith, Director, West Virginia Research Coordinating Unit for Vocational Education

Kenneth E. Underwood, Superintendent, Kanawha County Schools

James Ward, Principal, East Bank Senior High School

The faculty, staff, and students of East Bank Senior High School

APPENDIX B

Operation Guidance Product Elements

1. Steering Committee Handbook

Written in a procedural and systematic way, this document (536 pages) contains information for the management of the planning, implementation, and evaluation of a career development program in a comprehensive high school, grades 9-12. It also includes reference copies of product development elements 3, 4, and 7 through 13, below. Each school receives two copies.

2. Staff Development Handbook

Based upon the use of simulation in learning, this document (500 pages) serves as an instructional tool to assist school personnel to understand the concepts of Operation Guidance and follow the procedural steps in Operation Guidance. It also contains reference copies of elements 4 and 5, below. One copy of this document is provided to each school.

3. Camera-ready Materials

These materials (138 pages) are provided as part of the product so that the consumer can duplicate instruments, forms, tables, and special instructions that will be used in the local educational agency. Two copies are provided to each school.

4. Career Development Data

This data (85 pages) consists of information collected on the school and community; the results of the student, faculty, parent, and graduate surveys; the identification of existing resources, such as equipment, materials, space, people, and finances; and a description of career education programs presently in operation in the school and community. Two camera-ready copies and one loose-leaf binder are provided to each school.

5. Principal's Handbook

This document (50 pages) contains an overview of the Operation Guidance process and describes the Principal's role in the adoption of Operation Guidance, the orientation of Operation Guidance to the faculty/staff, and provides specific tools to assist the Principal in reviewing goals, behavioral objectives, career development plans, and evaluative program decisions. Two copies are provided to each school.

6. Advisory Committee Handbook

This handbook (30 pages) is written to provide personnel in the community serving on the Operation Guidance Advisory Committee an overview of Operation Guidance and contains tools to assist the committee in helping the school plan, implement, and evaluate a career development program. Ten copies are provided to each school.

7. Resource Assessment Procedural Guide

This guide (50 pages) contains procedural steps describing the role of the Resource Assessment Leader and the School and Community Description Task Force in the identification and accounting of resources. One copy is provided to each school.

8. Data Collection Procedural Guide

Specific procedural instructions are provided in this document (43 pages) so that the Data Collection and Tabulation Task Force, consisting of students and faculty, can collect career development data on the needs of students, faculty, parents, and graduates. One copy is provided to each school.

9. Data Tabulation Procedural Guide

This document (64 pages) consists of specific procedural instructions that assist the Data Collection and Tabulation Task Force in translating by hand raw data into meaningful data on provided tables. Ten copies are provided to each school.

10. Behavioral Objective Procedural Guide

This document (30 pages) contains procedural steps to assist behavioral objective specialists (faculty/staff members) to acquire an ability in the writing of behavioral objectives and provides useful techniques in assisting Career Development Unit coordinators and advisors to derive criterion and enabling objectives from goal statements. Six copies are provided to each school.

11. The Behavioral Objective Manual

Based upon the concept of programmed learning and self instruction, this manual (53 pages) defines the parts of a behavioral objective, types of behaviors that could be included in a behavioral objective, the differences between criterion and enabling objectives, and the process of deriving criterion and enabling objectives from goal statements. Six copies are provided to each school.

12. Method Analysis Procedural Guide

This guide (11 pages) consists of specific procedures to assist personnel in reviewing current and available career development methods applicable in their school. Two copies are provided to each school.

13. Career Development Unit Procedural Guide

This procedural guide (22 pages) consists of specific instructions developed to assist school personnel in preparing, implementing, and evaluating a Career Development Unit, defined as an instructional and/or counseling unit that attempts to achieve a career development goal. Ten copies are provided to each school.

14. AV 1, Operation Guidance: An Overview

This is a synchronized slide sound presentation (script included) that describes the Operation Guidance process and the kinds of people that will be involved in planning, implementation, and evaluation. One copy is provided to each school.

15. AV 2, Your Needs and Resources

This is a synchronized slide sound presentation (script included) that provides an overview of resource assessment, including a description of the School and Community Task Force and resource accounting; an overview of the needs assessment including a description of the Data Collection and Tabulation Task Force; and the relationship of resource assessment and needs assessment to the total scope of work. One copy is provided to each school.

16. AV 3, Program Goals

This is a synchronized slide sound presentation (script included) describing the process of writing goals based upon the career development needs of the youth in the school; who writes goals; and the relationship of sound, well written goal statements to the total career development program. One copy is provided to each school.

17. AV 4, Behavioral Objectives

This is a synchronized slide sound presentation (script included) describing the process of writing behavioral objectives that adequately reflect the goal statements; who writes behavioral objectives; and the relationship of good, well written and technically sound behavioral objectives to the total career development program. One copy is provided to each school.

18. AV 5, Career Development Units

This is a synchronized slide sound presentation (script included) describing the process of preparing, implementing, and evaluating Career Development Units; who is involved with Career Development Units; and the relationship of Career Development Units to a unified and integrated career development program. One copy is provided to each school.

19. Operation Guidance

Rubber stamp.

20. Career Guidance, A Handbook of Methods

Campbell, Walz, Miller and Krieger. Two copies are provided to each school.

APPENDIX C

Product and Installation Specifications

Product Specifications

1.0.0 The instrumental population will be able to state goals for a career planning program that:

1.1.0 Individually describe student outcomes which tend to ameliorate current student deficiencies in career planning competencies;

1.2.0 Are collectively responsive to directives of state and local educational agencies when available;

1.3.0 Are individually and collectively understandable by high school students and faculty;

1.4.0 As a sample, represent the domain of student deficiencies in career planning competencies.

2.0.0 The instrumental population will be able to select a set of program goals for implementing a career planning program that, within the resources available in the school and community for career planning assistance, are:

2.1.0 Optimally responsive to student needs for career planning competencies; and

2.2.0 Reflect directives of state and local educational agencies.

3.0.0 High school students will be able to attain program goals selected for implementation.

3.1.0 The instrumental population will be able to state behavioral objectives that:

3.1.1 Are logical derivations of program goal;

3.1.2 Comprehensively sample the domain of behaviors needed by students to attain the program goals (criterion and enabling objectives);

3.1.3 Describe the competencies needed by the instrumental population to facilitate student attainment of desired career development outcomes (the enabling objectives);

3.1.4 Communicate the intended outcomes to students and faculty.

3.2.0 The instrumental population will be able to acquire and organize available resources (people, space, equipment, materials individually and in combination in the school and community) to enable students to achieve goal(s). In order to do so, the instrumental population should be able to :

3.2.1 Select method(s) that maximize the chances for the specified actors to achieve the desired behavior(s), including currency, "face validity," content validity, external validity, and feasibility.

3.2.2 To the degree feasible and desirable, select resources (people, space, equipment, and materials in the school and community) outside the traditional responsibility of the school's pupil personnel services unit.

3.2.3 Allocate or reallocate available resources (people, space, equipment, and materials in the school and community) to maximize the number of goals that students have an opportunity to attain.

3.2.4 Delimit the allocation of resources to only those behavioral objectives that can be adequately supported.

3.2.5 Organize the available resources in such a manner as to maximize the chances for students to achieve the selected program goals.

3.3.0 The instrumental population will be able to install career planning activities into the school and/or community as indicated by the following:

3.3.1 Systematic means by which faculty and students are made aware of the opportunity to attain career planning competencies;

3.3.2 Satisfaction by participating faculty and students with the career planning activity;

3.3.3 Presence of necessary resources (people, space, equipment, and materials) in the school and/or community to accomplish the activity as specified in 3.2.3, 3.2.4, and 3.2.5, above, when needed.

3.4.0 The instrumental population will be able to describe the degree to which students achieve behavioral objectives and, if not, recommend alternate means which may enable students to do so.

Installation Specifications

1.0.0 The instrumental population will state that the prototypic Operation Guidance product is desirable for their school and that it will have or has had the desired impact on the career development of students.

1.1.0 The instrumetnal population will indicate that the career development of students is the responsibility not only of the counselors but of the entire facutly and community.

1.2.0 The instrumental population will state that the effective change of their school's career development program can be best effected through long-range planning and systematic implementation.

1.3.0 The instrumental population will state that they will accomplish the prescribed evaluations and make their own decisions about applying the results.

1.4.0 The instrumental population will state that the product will enable them to upgrade their career development program through systematic evaluation and palnning but is not a career guidance program, per se.

2.0.0 The instrumental population will organize themselves to accomplish the necessary planning and evaluation activities. This includes the formation and directing of a standing management group, ad hoc and standing working groups, and an external advisory group.

3.0.0 The instrumental population will state the need for (deficiency in) career planning and implementation competencies experienced by students.

3.1.0 Given questionnaires, the instrumental population will collect information on career planning competencies within the constraints prescribed by the protection of human subjects guidelines of the U.S. Department of Health, Education and Welfare.

3.2.0 Given completed questionnaires, the instrumental population will be able to compile the data manually or through the use of electronic data processing equipment. Manual tabulation will be 95 percent accurate.

4.0.0 The instrumental population will be able to state program goals.

4.1.0 The instrumental population will be able to distinguish between a program goal and a non-goal. The program goal will have a student specified as an actor and the desired career planning outcome that may or may not be in measurable and observable terms.

4.2.0 The instrumental population will be able to describe a construct for career planning competencies from which a program could be organized.

4.3.0 The instrumental population will be able to expand the construct in response to regulations issued by state and local educational agencies.

5.0.0 The instrumental population will be able to rank career development areas in order of desired implementation based on the degree to which students need to attain career planning competencies, the perception of student need by recent graduates, parents, and faculty/staff, and the regulations and resources of state and local educational agencies.

6.0.0 The instrumental population will be able to rank program goals in order of desired implementation based on the degree to which students need to attain career planning competencies and based on the regulations and resources of state and local educational agencies.

7.0.0 The instrumental population will be able to write behavioral objectives that will have an actor, an observable task the actor is to perform (i.e., behavior that is an outcome rather than a process), and criterion(s) to determine mastery of the task. The instrumental population will also demonstrate an understanding of behavioral objectives as follows:

7.1.0 Given a list of non-behavioral objectives, the instrumental population will be able to describe the deficiency in each objective without error.

7.2.0 Given a list of behaviors, the instrumental population will be able to select behaviors that are primarily examples of cognitive, affective, or psychomotor behaviors.

7.3.0 The instrumental population will be able to define criterion and enabling objectives.

8.0.0 The instrumental population will be able to (1) identify and (2) account for resources used for implementing career development units.

9.0.0 The instrumental population will be able to identify career guidance methods or sets of methods that will enable the actors (most likely students and faculty) to achieve a behavioral objective or a set of behavioral objectives and that will be supportable by existing resources.

10.0.0 The instrumental population will be able to develop evaluation instruments, including administering them and tabulating results from them, in order to assess the effectiveness and efficiency of the career development program.

11.0.0 The instrumental population will be able, for a given goal or set of goals, to incorporate objectives, methods, resources, and an evaluation strategy into an overall career development plan. The plan should include the desired installation strategy.

12.0.0 The instrumental population will be able to implement career development units, that is, carry out the career development plans, within the school.

13.0.0 The instrumental population will be able to revise their career development program to keep it current and effective, based on evaluative information.

14.0.0 Personnel

14.1.0 Individual members of the instrumental population may actively participate as often as they desire. However, the gross numbers of personnel required in each school are as follows:

14.1.1 Administrators—all.

14.1.2 Counselors—all.

14.1.3 Teachers—approximately 21.

14.1.4 Students—approximately 22.

14.1.5 Representatives of the community—approximately 7.

14.2.0 A Steering Committee member (teacher, counselor, student, or administrator) should not be required to spend more than an average of 1.5 hours per week working with the product.

14.3.0 A task force member (teacher, counselor, or student) should not be required to spend 2 hours per week for longer than 8 weeks working with the product.

14.4.0 Each school should need no more than a half-time coordinator to serve as a "change agent."

14.5.0 A customer service representative should not be required to serve more than 20 schools.

14.6.0 Total number of people can be scaled downward as the number of students in the school decreases from 600.

15.0.0 Time. A school should be able to complete one developmental cycle, including the pilot test of at least two career development units during the first academic year of using the product.

16.0.0 Cost

16.1.0 During one developmental cycle, a school will consume the following resources and services:

16.1.1 Printing (offset or comparable method) - the number of pages will be approximately 8.5 times the number of students in the school.

16.1.2 Reproduction - 200 copies.

16.1.3 Postage (if surveys are mailed) - approximately $100.

16.1.4 Office supplies (excluding paper for reporduction) - two reams of letterhead and 1400 business-size envelopes imprinted with the school's name.

16.1.5 Equipment - a 35 mm circular slide projector with remote control and, optionally, a slide-sound synchronizer capability.

17.0.0 The high school should be stable. Some indicators of the degree to which a school is stable are as follows:

17.1.0 The number and intensity of student, faculty, and community confrontations with the school and school district due to racial, socioeconomic, and/or political issues.

17.2.0 The rate at which school tax levys and bond issues are passed or failed.

17.3.0 The leadership style of the administration, including the degree to which the faculty and students participate in decision making.

17.4.0 The rate at which innovations are introduced into the school.

17.5.0 The rate at which the racial composition of the student body and/or faculty changes.

17.6.0 Frequency in changes of administrators, such as the principal, the superintendent, and other key administrators at the district level.

17.7.0 The frequency of administrative changes to the attendance area (geographic area in which the student population lives) for the school.

17.8.0 Number of reorganizations of the school either in the existing facility or due to a move to a new facility.

17.9.0 The rate at which the faculty changes due to retirement, transfer, and/or resignation.

18.0.0 The high school shoudl be willing to accept change. This does not imply that the school must be an "early adopter" of educational innovations. Some indicators of the degree to which a school would be willing to accept innovations are as follows:

18.1.0 The degree to which faculty and students perceive innovations as succeeding or failing, especially those developed by external developers.

18.2.0 The rate at which faculty and student suggestions and proposals for change are accepted and implemented by the administration.

18.3.0 The rate at which the faculty changes due to transfer and resignation.

18.4.0 The rate at which students drop out of school.

19.0.0 Each school using the prototypic Operation Guidance product will have a change agent and a cadre of advocates for the product, including, and probably most important, the principal. There should also be at least one advocate at the district and state levels of governance with sufficient influence and/or power to persuade key decision makers to encourage the adoption of the product. The presence of at least a district level policy on implementing accountability is highly desirable.

20.0.0 The product (combined product and installation packages) is developed for use by both staff and student members of the instrumental population in a variety of schools. Therefore, a balance between simplicity and sophistication is needed.

21.0.0 The instrumental population should be able to synchronize either manually or electronically the verbal and visual components of audiovisual materials.

22.0.0 Participation in Operation Guidance by the instrumental population should not unduly disrupt normal school operations.

APPENDIX D

AIDE Plan for Behavioral Objectives

THE CENTER FOR RESEARCH AND LEADERSHIP DEVELOPMENT
IN VOCATIONAL AND TECHNICAL EDUCATION
at
The Ohio State University

Program:	014	Vocational Development and Adjustment I: Career Planning Support System
Component:	014C	PLAN FOR DECISION EVENT REVIEW
Title:		Operation Guidance: Systems Approach for Upgrading Career Guidance Programs (Product Engineering)
Decision Event:	014Cb1	Recycling Decision for Module 4 of the Operation Guidance Product
Dates for Review:		March 6-7, 1974
Date of Plan:		January 1974

Program: 024, Vocational Development and Adjustment - R. E. Campbell

Workunit C, Operation Guidance (Product Engineering) - W. N. Suzuki

Decision Event: 1, Module Four (Behavioral Objectives)

Major Decision Point: Assessment of the Adequacy of Module Four

Proposed Date of Review: February 28, March 1, 1974

Decision Event Plan

1. Rationale

Module 4 is a critical link in the Operation Guidance system because it supplies the procedures and instructions for the instrumental population (teachers, students, counselors and administrators in comprehensive high schools) to develop behavioral objectives that are communicative, critical and comprehensive. During Module 4, the behavioral objectives are derived from the school's career guidance program goals which were identified and validated in the previous module. The objectives define and operationalize the career guidance goals, the general directions in which the school should move in order to satisfy pressing student needs. The objectives also serve as the basis for assessing the achievement of program goals and add to the data base and framework for initiating programs to ameliorate salient career development needs. The behavioral objectives are the means for assessing the adequacy of the Procedural Guides, Manual, and materials given to the schools in Module 4, in directing the development of behavioral objectives which meet certain necessary criteria.

The purpose of the decision event review is to: (1) assess or judge the quality of behavioral objectives from three of the summative product engineering field trial sites and if appropriate, (2) recommend necessary revisions to the materials provided to the schools. Findings of the review will be used to decide whether the Operation Guidance component is meeting the product specifications and provide information for final revision of the module.

2. Specifications and Criteria

Behavioral objectives will be assessed in terms of the following major product questions:

a. Do behavioral objectives contain critical behavioral outcomes (not processes)?

b. Are behavioral objectives logically related to needs and goals?

c. Are behavioral objectives clearly stated (communicate)?

d. Are behavioral objectives technically (ABCD "rule") adequate?

e. Are behavioral objectives sufficiently representative of the repetoire of behaviors necessary, as indicated by their associated goal?

In order to determine the adequacy of Module 4 instructions and procedures, a major process question must be addressed: Are there alternative ways for a school to produce behavioral objectives of equal or better quality at less expense (in terms of time)?

3. Data Elements

During the assessment, reviewers will be provided with copies of the following primary and secondary data:

Primary:

1. Form 2-10, Program Goals. Documentation of the Schools' program goals, which have been derived from statements of student needs, and of the behavioral objectives, which have been derived from the schools' program goals.

2. Procedural Guides 4-1 and 4-2 and Manual 4-1.

3. Report from the review of decision event 014Cal. The report contains the findings of and recommendations made by two external reviewers during the assessment of statements of students needs from three comprehensive high schools serving as field trial sites.

Secondary:

1. Manual 2-2, School Characteristics. The documentation of the findings of a needs assessment by each of the field sites. The primary source of data was from a survey of students, faculty/staff, parents and graduates.

2. Form 2-8, Community Characteristics. Documentation of existing information on the community, such as labor force information, social service agencies, etc.

3. Other materials may be useful to the reviewers, especially if they make recommendations for revising product elements of Module 4, will be provided upon request. These supplementary materials are:

   a. Project and Product Memorandums. Anecdotal comments, suggestions, problems, etc., identified by the on-site project staff members are recorded on these forms.

   b. Project Log. The project logs contain a daily summary of activities at the field trial sites. They are prepared by the on-site project staff members.

4. Conditions

Considerations pertaining to development of the outputs, e.g., reading difficulty of materials, task force membership and sophistication, are as follows:

1. Each school is unique. Therefore, goals and behavioral objectives are expected to differ among the three schools serving as field trial sites for summative product engineering.

2. Members of task forces are, as a whole, not prepared to derive behavioral objectives prior to the use of the Operation Guidance materials. Step-by-step procedures and self-instructional materials were provided to assist them with their task.

3. Procedural guides, instrumentation, and self-instructional materials have been developed for use by both faculty and students at comprehensive high schools. Therefore, materials may be too simplistic and detailed for some members of the target population; too sophisticated for others. Since the materials are in the product engineering stage, major deviations from the procedures are discouraged, but schools have been observed deviating from the prescribed procedures.

4. There are ten members on the Behavioral Objectives Task Force, including the chairperson, at each of the three field trial sites. Working in teams of three (3), task force members develop and refine behavioral objectives for the career guidance goals (Form 2-10) which are equally divided among the team. After the objectives are written, the teams convene as a whole to review and rate the quality of the entire group of behavioral objectives and refine the objectives when appropriate.

5. The procedures and instrumentation for accomplishing all tasks through the development of behavioral objectives have been revised once based on evaluative data from one prior field trial of the materials.

5. Review Procedures

At least one week prior to the review, three reviewers selected on the basis of their methodological and substantive expertise in guidance evaluation and materials development, will receive:

a. Cover letter verifying review request; charges and responsibilities of reviewer(s); date(s) and time of review; schedule for review and information on travel, accommodations, and per diem.

b. Program and workunit abstracts.

c. Operation Guidance outputs/outcomes.

d. Organization of school committees.

e. Summary of data sources for evaluation of the core procedural system.

f. Decision Event plan including Appendix A: reviewer instructions and Appendix B: flow chart of review procedures.

g. Procedural Guides 4-1 and 4-2.

h. Manual 4-1.

Each of the reviewers will assess the behavioral objectives (Forms 2-10) from two of three schools and report his/her judgments and comments on Reviewer Worksheets. If appropriate, reviewers will make recommendations for revisions in Operation Guidance materials. Each reviewer will independently prepare a report of his/her findings and recommendations in accordance with Attachment A: Format for Reviewer Report.

It is anticipated that two days are needed for the review, at the end of which time a debriefing session will be held. Program personnel will be given an opportunity to ask for clarificaiton of reviewer comments and judgments. (It is understood that agreement between reviewer(s) and program staff is not required).

6. General Directions for Reviewers

Step A: Review Procedural Guides 4-1 and 4-2 and Manual 4-1 prior to assessing objectives.
Step B: Procedures: Review of Behavioral Objectives:

1. Given a list of criterion and enabling objectives and their associated career development goals (Forms 2-10), the reviewers should examine a criterion objective and all its associated enabling objectives before proceeding to the next criterion objective. Judgments about criticality, logicality, clarity and technical adequacy for each objective as well as comments and suggested revisions will be recorded on Reviewer Worksheet Form A for an appropriate goal.

2. After reviewing and judging all the enabling objectives for a particular criterion objective, the reviewers should determine if the enabling objectives are comprehensive, that is sufficient in and of themselves to define the criterion objective or adequately define the critical behaviors necessary to achieve the criterion objective. Judgments about comprehensiveness will be recorded on the Reviewer Worksheet, Form A.

3. The reviewer should examine the next criterion objective and its associated enabling objectives, concomitantly recording judgments and comments on the Reviewer Worksheet, Form A.

4. The reviewer should determine if the criterion objectives are comprehensive, that is, if they are sufficient in and of themselves to define the goal. Judgments and comments concerning revisions, additions and deletions will be recorded on Reviewer Worksheets.

5. After reviewing all criterion and enabling objectives for a goal, the reviewer should proceed to the next goal and begin a new Reviewer Worksheet, rating objectives as specified in the previous steps.

Step C: Procedures: Review of Materials

Area of Concern

1. The reviewers should examine the ratings of behavioral objectives on Reviewer Worksheets Form for patterns or consistencies in objectives not meeting the criteria: criticality, logicality, clarity, technical adequacy and comprehensiveness.

a. If necessary, the reviewers should (1) trace problems back to the appropriate sections in Manual 4-1 and Procedural Guides 4-1 and 4-2 and/or (2) determine if problems reflect constraints within the school or community.

b. If materials are deemed as inadequate for a school and changes are necessary, reviewers should make specific recommendations for revisions in the materials. Reviewers should use Reviewer Worksheet Form b to record comments and recommendations.

2. The reviewers should examine the criterion and enabling objectives for a school to determine if there are problems in distinguishing between criterion and enabling objectives.

   a. If appropriate, the reviewers should trace problems back to the sections in Procedural Guides 4-1 and 4-2 and Manual 4-1.

   b. If changes are necessary in the materials, reviewers should make specific recommendations for revisions on Reviewer Worksheet Form b.

   c. Reviewers should determine if a distinction should be made between criterion and enabling objectives using previous ratings and comments as a basis for judgment.

      (1) If the distinction between enabling and criterion objectives should not be made, reviewers will provide a rationale for this judgment.

      (2) If a distinction between enabling and criterion objectives should be made, reviewers will provide a rationale for this judgment especially in light of the adequacy of materials and the ratings on Reviewer Worksheet Form A. If materials need to be changed, reviewers should make suggestions for revisions on Reviewer Worksheet Form b.

3. The review procedures in "1" and "2" above are repeated for the next schools assigned to reviewers. The adequacy of materials is assessed on the basis of criterion and enabling objectives from each school.

4. Reviewers should determine if changes in materials are unique to a school or necessary across schools. Reviewers should point out revisions and changes warranted by ratings of ofjectives and assessment of materials for both schools. Comments and recommendations should be recorded on Reviewer Worksheet Form b.

Step D: Summary Findings

1. The reviewers should provide a summary of findings about the acceptability of behavioral objectives and the adequacy of materials. On the Summary Findings Sheet, reviewers will record their judgments and provide a rationale incorporating and summarizing previous judgments and comments.

Comments:

1. The decision event is also an NIE milestone.

2. The dates of the desired review have not yet been firmly set since the rate at which each participating school progresses is self-determined. The review is tentatively scheduled for February 28 and March 1, 1975.

Decision Alternatives:

Based on the review of data elements, each reviewer will be asked to rate whether the objectives, as a whole and for each school are acceptable and whether the materials (Procedural Guides and Manual) as a whole and individually for each school are adequate in instructing and guiding schools to produce acceptable objectives. Reviewers will record their judgments and provide a rationale for each of their judgments on the Summary Findings sheet.

These ratings will be the basis for a decision concerning revisions that may or may not be needed in the materials and, if warranted, termination of the workunit.

REVIEWERS INSTRUCTIONS

Introduction

This guide is intended to be self administering. The procedural steps that follow and the accompanying flow chart (Appendix A) describe the process to be used in determining the quality of the behavioral objectives found on or attached to Forms 2-10 (Program Goals). An example Form 2-10 is attached (Appendix B).

Before starting the actual assessment of the behavioral objectives, it is suggested that the following three tasks be accomplished: (a) double check the package of materials to insure that you have all the necessary materials: copies of Form 2-10, Reviewer Worksheets, Summary Findings sheet, Flow Chart of Review Procedures, Procedural Guides 4-1 and 4-2 and Manual 4-1, (b) carefully read Procedural Guides 4-1 and 4-2 and (c) carefully read Manual 4-1.

The flowchart in Appendix A provides an overall graphic description of the evaluation process. The procedural steps in Section I explicate the tasks outlined in the flowchart. To facilitate the use of the flowchart, each procedural step has been numbered according to the corresponding step in the flowchart. It is recommended that the procedural steps be used as you go through at least the first cycle of evaluation, i.e., the first goal and its related behavioral objectives. As you become familiar with the process you may want to use the flowchart and the procedural steps as a reference.

After you have completed assessment of the behavioral objectives according to the procedural steps in Section 1, look at the entire group of behavioral objectives for each school. Determine if there is a pattern or consistency in objectives that do not meet specified criteria. If you find this to be the case, determine whether the source of problems is perhaps due to constraints within the school (see project logs and information about the school and community) or inadequacies in the Manual and Procedural Guides.

Procedural steps in Section II will guide you in tracing problems with behavioral objectives back to the appropriate parts of the Procedural Guides and Manual. Suggest ways to improve the materials and provide alternatives to Module 4 procedures.

After you have completed (1) assessing the behavioral objectives and (2) examining materials as warranted by the objectives, you are asked to arrive at some overall conclusions as a culmination and synthesis of your previous comments and decisions regarding the behavioral objectives and materials. Record your judgments on the Summary Findings sheet and make recommendations for future courses of action regarding use of the materials.

GLOSSARY

Behavioral Objective: A statement that describes what a person should be able to do after completing a learning experience. Behavioral objectives are written in clear, specific and communicative terminology. They describe cognitive, affective or psychomotor behavior in relation to a more global goal.

Clarity: The degree to which a behavioral objective is written in a clear and unambiguous way; the extent to which the behavioral objective communicates to its audience.

Comprehensiveness: The degree to which a cluster of behavioral objectives have included all critical behaviors needed to adequately achieve the goal or criterion objective which the particular cluster is describing.

Criterion Objective: A behavioral objective which is derived directly from program goals. They define the knowledge, skills, and attitudes that are needed by an actor to achieve goals. Criterion objectives are often called "terminal objectives" since they describe only the final or ultimate set of knowledge, skills, and attitudes needed by an individual to demonstrate the achievement of goals.

Criticality: The degree to which a behavioral objective is necessary, important, or relevant to describe the goal (or criterion objective) which it is describing.

Enabling Objective: A behavioral objective which specified knowledge, skills, and attitudes that are needed by students to achieve a criterion objectives. Enabling objectives are derived from criterion objectives.

Goal: A statement written as a possible solution to career development problems or deficiencies obtained directly from a needs assessment. Goals serve as the basis for describing a career development program, and should specify what students need in order to make the transition from school to the world of work or post-high school education.

Logicality: The degree to which a behavioral objective is logically derived from the goal (or criterion objective) which it describes.

Technical Adequacy: The degree to which a behavioral objective conforms to the ABCD rule (page 6 of Manual 4-1); specifically, the presence of a clearly defined actor, a specific behavior, an adequate statement of conditions (if necessary), and an appropriate degree of success measure.

SECTION I:

Review of Behavioral Objectives

PROCEDURAL STEPS

Goals (green)

1. Read one career guidance goal located on Form 2-10. Record the number of this goal in the appropriate space in the Reviewer Worksheet.

Criterion Objectives (blue)

2. Read a criterion objective that describes the goal above. Record the number of this criterion objective in the appropriate space in the Reviewer Worksheet.

3. Determine whether the criterion objective is critical or not. Ask yourself the following question:

   Does this criterion objective describe a necessary and important behavior relevant to career development?

   If your answer to the above question was "yes," check the "yes" column under the "critical" heading for that particular criterion objective and proceed to step 5 below. If, in your estimation, the criterion objective seems unimportant, check the "no" column under the "critical" heading for that particular criterion objective. Indicate your reasons in the comment section and proceed to step 4.

4. Answer the following question:

   Is this the last criterion objective for this particular goal? If your answer to the above question is "yes," proceed to step 24. If your answer is "no," return to step 2 above.

5. Determine if the criterion objective is logical. Answer the following questions:

   Is the criterion objective logically derived from the goal which it defines? Does the criterion objective seem to fit or describe the domain of the goal? If, in your judgment, the criterion objective is logically derived from the goal, check the "yes" column under the "logical" heading for that criterion objective and proceed to step 7. If you believe the criterion objective does not logically describe the goal, check "no" in the "logical" column and proceed to step 6.

6. Determine an appropriate goal. Since this criterion objective has been found to be a critical behavior but does not logically describe the goal, an alternative goal should be identified by one of the two following processes:

   a. Review the list of Career Guidance Goals and determine if the criterion objective adequately and logically describes one of these goals. If so, record the number of *the new goal in the comment section following the particular* criterion objective in question.

   b. If none of the goals found on the Career Guidance Goal list seem appropriate for the criterion objective, create a goal from which the criterion objective logically flows. Record this new goal in the comment section.

7. Determine if the criterion objective is clear. The following questions will help you in this decision:

   Is the criterion objective written in a manner that is neither vague nor ambiguous?

   Is the criterion objective written in an understandable way? If the answer is "yes," check the "yes" category of the "clear" column and proceed to step 9 below. If the answer is "no," check the "no" category of the "clear" column for that particular criterion objective and proceed to step 8.

8. Clarify the criterion objective by rewriting any vague or ambiguous portions. Record the revised criterion objective in the "comment" section.

9. Determine if the criterion ofjective is technically adequate according to the ABCD rule. (The ABCD rule is discussed in Manual 401, pages 7-19.) The following questions should be answered:

   a. Does the criterion objective specify a clearly defined actor?

   b. Does the criterion objective specify an observable behavior?

   c. Does the criterion objective specify an appropriate condition? (A condition is optional.)

   d. Does the criterion objective specify a degree of success or a measurable criterion?

   If any of the above questions can be answered "yes," check the "yes" column under "technical adequacy" and proceed to step 11. If the answer to all of the four questions above is "no," check the "no" column under "technical adequacy" and proceed to step 10.

10. For each question in step 9 that was answered "yes" add the missing part of the criterion objective; that is, the actor, behavior, condition, or degree of success, whichever is applicable, and record the missing portion(s) in the comment section.

Enabling Objectives (yellow)

11. Determine if any enabling objectives exist for the criterion objective under study. If there are any enabling objectives, proceed to step 12. If no enabling objectives exist for this particular criterion proceed to step 21.

12. Read an enabling objective carefully and record the number of the enabling objective in the appropriate space on the Reviewer Worksheet.

13. Determine whether the enabling objective is critical or not. Answer the following question:

    Does this enabling objective describe a necessary and important prerequisite behavior needed to achieve the criterion objective which it defines?

    If your answer is "yes," check the "yes" category of the "critical" column for that particular enabling objective and proceed to step 14. If your answer to the above question is "no," check the "no" response under the "critical" heading for that particular enabling objective and proceed to step 20.

14. Determine if the enabling objective is logical. Answer the following questions:

    Is the enabling objective logically derived from the criterion objective which it describes? Does the enabling objective seem to fit or define the domain of the criterion objective?

    If, in your judgment, the enabling objective is logically derived from the criterion objective, check the "yes" response under the "logical" heading for that particular enabling objective and proceed to step 16. If you believe the enabling objective is not a necessary prerequisite to achieve the criterion objective, check the "no" response.

15. Suggest an appropriate criterion objective. Since this enabling objective has been found to be a critical prerequisite behavior, but is not logically derived from the criterion objective, an alternative criterion objective must be formulated by one fo the following processes:

    a. Review other criterion objectives describing the goal in question and decide if the enabling objective is a necessary prerequisite for another criterion objective. If so, record the number of the criterion objective in the "comment" section.

    b. Suggest a criterion objective which describes the goal being analyzed for which the enabling objective becomes a logical prerequisite. Write this new criterion objective in the "comment" section.

16. Determine if the enabling objective is clear. The following questions will help you in this decision:

Is the enabling objective written in a manner that is neither vague nor ambiguous? Is the enabling objective written in an understandable way?

If the answer to the above questions is "yes" check the "yes" response in the "clear" column and proceed to step 18. If the answer is "no" check the "no" response and proceed to step 17.

17. Suggest ways in which the enabling objective could be clarified by rewriting any vague or ambiguous portions. Record the revised enabling objective in the "comment" section.

18. Determine if the enabling objective is technically adequate according to the ABCD rule. The following questions should be answered:

    a. Does the enabling objective specify a clearly defined actor?

    b. Does the enabling objective specify an observable behavior?

    c. Does the enabling objective specify an appropriate condition?

    d. Does the enabling objective specify a degree of success or measurable criterion?

    If any of the above questions can be answered "yes," check the "yes" response under the "technical adequacy" column and proceed to step 20. If the answer to all of the four questions above is "no," check the "no" response and proceed to step 19.

19. Suggest ways in which the enabling objective could be technically improved. Record the revised enabling objective in the "comment" section.

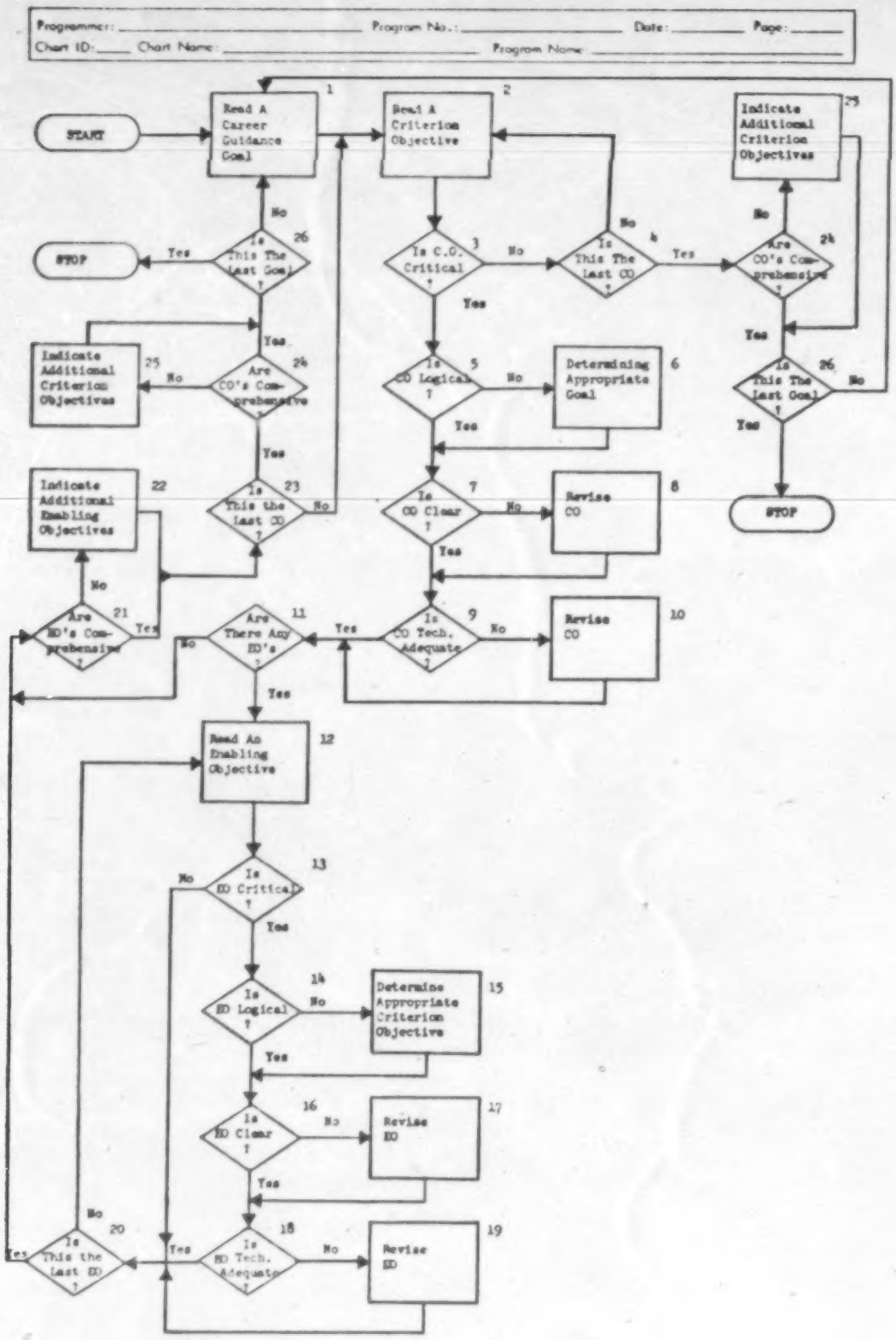
20. Answer the following question:

    Is this the last enabling objective for this particular criterion objective?

    If your answer to the above question is "yes" proceed to step 21.
    If your answer is "no," return to step 12 above.

21. Determine the comprehensiveness of the enabling objectives. Reread the goal and criterion objective from which the enabling objective(s) are derived. In your opinion, are there any critical prerequisite behaviors or enabling behaviors that may have been overlooked? If you believe that all critical enabling objectives have been identified, place a check in the "yes" response in the "comprehensive" column related to the set of enabling objectives being studied and proceed to step 23. If any other enabling objectives are needed for the criterion objective, check the "no" column under "comprehensive" and proceed to step 22.

REVIEW OF BEHAVIORAL OBJECTIVES



080

22. Suggest any additional prerequisite behavior, or preferably, enabling objectives on a separate sheet of paper for the particular set of enabling objectives in question. Make sure that the number of the goal and the criterion objective from which the new enabling objective is derived are also indicated on the paper.

23. Answer the following question:

    Is this the last criterion objective for this particular goal? If your answer to the above question is "yes," proceed to step 24. If your answer is "no," return to step 2 above.

24. Determine the comprehensiveness of the criterion objectives. Reread the goal from which the criterion objective(s) are derived. In your opinion, are their any critical criterion objectives that may have been overlooked? If you believe that all critical criterion objectives have been identified, place a check in the "comprehensive" column related to the set of criterion objectives being studied and proceed to step 26. If any other criterion objectives are needed to define th goal adequately, check the "no" column under "comprehensive" and proceed to step 25.

25. Record any additional behaviors, or preferably, criterion objectives on a separate sheet of paper for the particular set of criterion objectives in question. Indicate also any enabling objectives which may be needed to describe any prerequisite behaviors necessary for the achievement of any new criterion objectives that have been identified. Be sure to indicate the number of the goal from which the new criterion objective is derived.

26. Answer the following question:

    Is this the last goal in your set of Program Goals (Form 2-10)?

    If the answer to this question is "no," return to step 1 above. If the answer is "yes," you have completed your task. You may want to write down any overall comments regarding the contents of the behavioral objectives you've just evaluated.

Section II

Review of Materials

PROCEDURAL STEPS

1. Examine the entire group of behavioral objectives for one school. Determine if there are patterns or consistencies in objectives not meeting one or more of the criteria: criticality, logicality, clarity, technical adequacy and comprehensiveness on the Review Worksheets forms (see glossary for operational definitions of the criteria).

   a. If an unreasonable number of behavioral objectives seem to consistently contain uncritical behavioral outcomes, examine Procedural Guides 4-1 and 4-2, Manual 401, page 28-32. Look for omissions, ambiguities, insufficiencies, etc. in the materials that might be contributing factors to objectives not meeting this criterion. Identify community and school characteristics (available for each school from program personnel) which indicate or verify that the behaviors are not critical and suggest behaviors that might be considered critical. How can the manual and procedural guides be revised so that schools will develop behavioral objectives containing critical career development behaviors? Use Reviewer Worksheet form b to record your comments and specific recommendations.

   b. If an unreasonable number of behavioral objectives are not logically derived; that is, criterion objectives are not logically derived from goals and enabling objectives are not logically derived from criterion objectives, refer to Procedural Guides 4-1 and 4-2, Chapter V pages 35-37 in Manual 4-1 and Forms 2-1C, program goals. Determine if problems are due to directions and guidelines in the materials or perhaps attributable to constraints within the school. How can the materials be changed so that schools can better derive goals and objectives? Use Reviewer Worksheet form b to record your comments and specific recommendations.

   c. If an unreasonable number of behavioral objectives are not clear, refer to Procedural Guides 4-1 and 4-2 and pages 6-21 in Manual 4-1. How can the materials be changed so that behavioral objectives are more clearly communicated? Use Reviewer Worksheet form b to report your comments and specific recommendations.

   d. If an unreasonable number of behavioral objectives are not technically adequate (follow the ABCD rule), determine if deficiencies are due to the materials: Procedural Guides 4-1 and 4-2 and pages 6-21 in Manual 4-1. How can the materials be changed so that schools can produce behavioral objectives that are technically adequate? Use Reviewer Worksheet form b to record your comments and specific recommendations.

e. If an unreasonable number of objectives are not comprehensive to sufficiently define a goal or a criterion objective, determine if problems are due to deficiencies in the Procedural Guides or constraints in the school. How can the materials be changed so that objectives are representative of behaviors necessary to achieve the goal and/or objective? Use Reviewer Worksheet form b to record your comments and specific recommendations.

2. Repeat the above procedures for the second school to which you have been assigned. The adequacy of materials is assessed in the basis of criterion and enabling objectives from each school.

3. Examine the criterion and enabling objectives for each school to determine if there are problems in distinguishing between criterion and enabling objectives. Record any comments or specific recommendations on Reviewer Worksheet Form b.

4. Determine if changes in materials are unique to a school or necessary across both schools. You may confer with the other reviewers to determine degree of change and substantiate your specific recommendations. Record your comments and specific recommendations on Reviewer Worksheet form b.

5. Summarize your findings about the acceptability of behavioral objectives overall and for each school on the Summary Findings sheet in your packet of materials. Provide a brief rationale for your judgments as a summary of your previous comments and judgments.

6. Summarize your findings about the overall adequacy of the Procedural Guides and Manual together in instructing the schools (as a group) in producing acceptable b.o.'s. Then rate the adequacy of Procedural Guides 4-1, 4-2 and Manual 4-1 individually in instructing each school separately.

Goal: _____

REVIEWER WORKSHEET

Form a

Reviewer _____

Data Set (School) _____

Page _____ of _____ Pages

ID Number of Objective	Type of Objective	Criteria										Comments
		Critical		Logical		Clear		Technically Adequate		Comprehensive		
	co eo	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	

084

Section II:
Materials

Reviewer _____
School(s) _____

Reviewer Worksheet Form b

General Area of Concern:

Specific Recommendations (if possible, reference page numbers and step numbers in the Procedural Guides and Manual)

Reviewer _____

Date _____

Summary Findings

I. Behavioral Objectives

A. Overall, the behavioral objective for both schools are:

( ) Acceptable ( ) Acceptable with revisions ( ) Unacceptable

B. The objectives developed by

1. School _____ are:

( ) Acceptable ( ) Acceptable with revisions ( ) Unacceptable

2. School _____ are:

( ) Acceptable ( ) Acceptable with revisions ( ) Unacceptable

C. Rationale:

II. Materials

A. Overall, the materials (PG 4-1 and 4-2, Manual 4-1) are:

( ) Adequate ( ) Adequate with revisions ( ) Inadequate

B1. Procedural Guide 4-1 for School _____ is:

( ) Adequate ( ) Adequate with revisions ( ) Inadequate

B2. Procedural Guide 4-1 for school _____ is:

( ) Adequate ( ) Adequate with revisions ( ) Inadequate

B3. Procedural Guide 4-1 for School _____ is:

( ) Adequate ( ) Adequate with revisions ( ) Inadequate

B4. Procedural Guide 4-2 for school _____ _____ is:

( ) Adequate ( ) Adequate with revisions ( ) Inadequate

B5. Procedural Guide 4-2 for school _____ is:

( ) Adequate ( ) Adequate with revisions ( ) Inadequate

B6. Procedural Guide 4-2 for school _____ is:

( ) Adequate ( ) Adequate with revisions ( ) Inadequate

B7. Manual 4-1 for school _____ is:

( ) Adequate ( ) Adequate with revisions ( ) Inadequate

B8. Manual 4-1 for school _____ is:

( ) Adequate ( ) Adequate with revisions ( ) Inadequate

b9. Manual 4-1 for school _____ is:

( ) Adequate ( ) Adequate with revisions ( ) Inadequate

C. Rationale:

III. Recommendation

A. Overall

B. Procedural Guide 4-1

C. Procedural Guide 4-2

D. Manual 4-1

APPENDIX E

Product Engineering Phase Position Description

Field Associate

Activities:

Establish and maintain liaison between school and school district and The Center.

Collect evaluative data through test and survey instruments.

Collect evaluative data through observation and interviews.

Analyze evaluative data.

Monitor individual and group performance on Center-developed materials and procedures.

Assist school to use materials and procedures, if needed.

Revise Center-developed materials and procedures as needed.

Prepare progress and incident reports.

Perform administrative functions, such as keep financial records, plan meetings, and direct secretary.

Requirements:

Education: Master's degree in guidance and/or counseling, educational technology, educational research and development, or educational evaluation.

Educational Experience:

1. Minimum two years teaching or guidance counseling at high school level;
2. Participated in the planning, development, and evaluation of educational products using a systems approach, including the derivation of behavioral objectives.

Personal Characteristics:

1. Ability to:

   a. Observe unobtrusively and assess accurately group and individual behavior.

   b. Receive and develop further information, from others, including criticism; does not react to criticism strongly or quickly or with defensive or submissive behavior.

   c. Interact with students, teachers, counselors, and administrators individually or in groups.

   d. Analyze information objectively.

   e. Make decisions rapidly and objectively.

   f. Communicate information to groups.

   g. Follow a task through to its completion independently and systematically.

   h. Follow directions precisely.

   i. Moderate individual conflicts.

   j. Recognize problems, develop alternative solutions, and specify consequences for each alternative solution.

   k. Handle confidential information.

2. Familiar with:

   a. Community

   b. Organizational structure and administrative procedures of the school and school district.

3. Willing to travel to The Center for training.

APPENDIX F

National Field Test Position Description

School Coordinator for Operation Guidance

This position description is intended only as an aid to selecting the school coordinator and it is based on The Center's three years of experience working with individuals in comparable positions. It is our belief that persons who generally meet the requirements below will have the best chance of dealing successfully with the demands of the position.

Role and Responsibilities

The school coordinator will be closely involved with the staff, students, and community persons in one high school of the cooperating LEA for at least two years. The coordinator will occupy a vital position as the Steering Committee chairperson and will work in this capacity at least half-time, year-round. The Steering Committee oversees all the Operation Guidance activities and makes final recommendations to the school principal for final decision based on the data gathered and processed through Operation Guidance procedures. Therefore, it is essential that the coordinator clearly understand the Operation Guidance product and process. He or she should also be a resource person to the school for career guidance methods that are reported in the professional literature.

The coordinator will have a specific leadership position within the school and will assist counselors, teachers, administrators, students, and persons in the community as they implement the various phases of the Operation Guidance package. This person must be skilled in working with individuals and groups and supporting them in their efforts. If necessary, the coordinator must be willing to take appropriate action needed to resolve these problems. The school coordinator should be a person who engages in thoughtful consideration before making decisions but should also be comfortable with the responsibility of making rapid decisions when necessary.

Requirements

1. Essential

   a. Ability to establish rapport with local education agency personnel and state education agency personnel.

   b. Enthusiastic commitment to the need for career development programs and the provision of effective career development services to students.

c. A minimum one year of experience as a guidance counselor or in other positions requiring familiarity with career development, such as career education coordinator, etc.

d. A minimum three years experience as an educational professional in an LEA.

e. A master's degree with study areas relevant to career development theories and practices (e.g., career guidance, career education, counseling psychology, vocational counseling, etc.).

f. Experience making presentations to groups, including teachers and students.

g. In cases where existing state certification standards apply to this position and those standards exceed these, state standards shall take precedence.

2. Desirable

a. Experience in the school selected for participation in the product field test and knowledge of the target community.

b. Experience directing or coordinating developmental activities, especially those involving adults.

c. Work experience in non-educational occupations, especially in occupations that normally do not require a baccalaureate or higher degree for entry.

d. Expertise in methods of research, evaluation, systems technology, and change processes as they apply to educational institutions.

e. Experience in curriculum development.

f. Knowledge of and experience with the derivation and use of behavioral objectives.

3. Other Desirable Personal Characteristics and Skills

a. Success in this position may depend very much on the person's ability to maintain and cultivate good professional relationships with others. Consider some of these characteristics:

(1) Open-minded.
(2) Confident decision maker.
(3) Supportive of others.
(4) Handles conflict diplomatically and skillfully.

b. The person should have the ability to identify past, present, and potential problems and to hypothesize alternate solutions creatively.

c. The person should be able to function as a keen and tactful observer and assess behaviors accurately.

d. The person should be flexible and tolerant of ambiguity and diversity.

092